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ON THE  
CONSTANT QUANTITY  
OF THE  
MOON'S HORIZONTAL EQUATOREAL  
PARALLAX,

AS DEDUCED FROM  
OBSERVATIONS MADE AT THE CAMBRIDGE OBSERVATORY,  
AND THE ROYAL OBSERVATORIES OF GREENWICH, EDINBURGH,  
AND THE CAPE OF GOOD HOPE.

By HUGH BREEN, Esq.  
FORMERLY OF THE ROYAL OBSERVATORY, GREENWICH.

*(Forming Part of Vol. XXXII. of the Memoirs of the Royal Astronomical Society.)*

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1863.



2. 12. 13 -

VII. *On the Constant of the Moon's Horizontal Equatoreal Parallax, as deduced from Observations made at the Cambridge Observatory, and the Royal Observatories of Greenwich, Edinburgh, and the Cape of Good Hope.* By HUGH BREEN, Esq., formerly of the Royal Observatory, Greenwich.

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THE late Professor HENDERSON, in the tenth volume of the *Memoirs* of the Royal Astronomical Society, has deduced from the zenith distances of the Moon, observed by him at the Cape in 1832 and 1833, combined with corresponding observations at Greenwich and Cambridge, a constant of lunar parallax, which had been generally received by astronomers as a trustworthy correction to the number adopted by BURCKHARDT in his Lunar Tables, until the investigations of Professor ADAMS, published in 1853, showed that the periodic terms of those tables were erroneous in principle, and that no constant correction could be applied to the results. The only value of Professor HENDERSON's determination is in his comparisons with DAMOISEAU's Tables (1828) in the same Memoir, in which he finds, from a mean of thirty-four observations, that the constant adopted in their formation was too small by  $1''.56$ , or the result was  $57' 2''.46$ . Professor ADAMS has, however, shown that several terms have been omitted by DAMOISEAU in his Lunar Tables (1824), which, in the aggregate, may produce an influence on the final result, and in the *Notices* of the Royal Astronomical Society, vol. xiii. page 263, he gives the accurate formulæ for use in conjunction with DAMOISEAU's arguments, neglecting only those terms, the greatest values of which do not exceed  $0''.05$ . The constant adopted by Professor ADAMS is  $57' 2''.32$ , and the formulæ are as follows:—

$$\begin{aligned}
& 3422''32 + 186''51 \cos x & + 10''17 \cos 2x & + 0''63 \cos 3x + 0''04 \cos 4x \\
& - 0'95 \cos t & + 28'23 \cos 2t & + 0'26 \cos 4t \\
& + 34'30 \cos (2t - x) & & + 0'37 \cos (4t - 2x) \\
& - 0'40 \cos z & + 1'92 \cos (2t - z) & + 1'45 \cos (2t - x - z) \\
& + 1'16 \cos (x - z) & - 0'71 \cos (2y - x) & - 0'95 \cos (x + z) \\
& + 0'01 \cos (x - t) & - 0'31 \cos (2x - 2t) & \\
& - 0'31 \cos (2t + z) & - 0'23 \cos (2t - x + z) & \\
& - 0'11 \cos (2y - 2t) & + 0'22 \cos (2t + x - z) & - 0'12 \cos (2x - 2t) \\
& + 0'14 \cos (t + z) & + 3'09 \cos (2t + x) & + 0'60 \cos (4t - x) \\
& - 0'11 \cos (t + x) & + 0'28 \cos (2t + 2x) & \\
& + 0'12 \cos (2x - z) & - 0'10 \cos (2x + z) & + 0'09 \cos (2t - 2z) \\
& - 0'09 \cos (2y + x - 2t) & + 0'05 \cos (2t - x - 2z) & + 0'06 \cos (4t - x - z)
\end{aligned}$$

The preceding formulæ give results nearly identical with the tables, adapted to BURCKHARDT'S form of the arguments, which Professor ADAMS has published in the supplement to the *Nautical Almanac* for 1856. Professor ADAMS has, likewise, added to these tables corrections of the *Nautical Almanac* horizontal parallax of the Moon for every day of the year from 1840 to 1855 inclusive, in order to give facilities for a re-determination of the constant of lunar parallax from the Cape Observations of later years.

The only additional observations, however, which have been published since Professor HENDERSON'S Memoir, are those made by the Rev. FEARON FALLOWS, at the Cape in 1830, which have been reduced under the superintendence of the Astronomer Royal, and the volume containing the observations of 1834, 1836, and 1837, by THOMAS MACLEAR, Esq. The total number of observations at the Cape thus available (not including those observed by Professor HENDERSON) is 88, which present a series of zenith distances, from which it might be inferred that a result of considerable accuracy could be deduced. All these have, indeed, been made by the use of the celebrated Cape circle of JONES, which was afterwards found faulty in its mounting, but the investigations of the Cape and other astronomers have shown that the mean of microscopes was sufficiently correct to be relied on. Corresponding observations have been readily obtained from the Royal Observatories of Greenwich, Edinburgh, and the observatory of Cambridge, all of which have

been reduced on a system, which is explained in the printed volumes. Thus every facility is given for the continuation of Professor HENDERSON'S work. Having had, for many years past, this object in view, I had the honour to propose, for the consideration of my Lords Commissioners of the Admiralty, a new determination of the constant of lunar parallax, which their Lordships, in September 1861, were pleased to sanction.

The following methods have been pursued in the calculations.

The Moon's horizontal equatoreal parallax has been calculated from the preceding formulæ of Professor ADAMS, for those days on which corresponding observations have been obtained, and corrections of BURCKHARDT'S parallax (given in the following table) have been found by comparison with the *Berlin Ephemeris* of 1830, 1832, and 1833, and the *Nautical Almanac* of 1834, 1836, and 1837. The corrections, thus deduced, have then been multiplied by the sine of the zenith distance, and applied to the printed reductions. At the same time, BURCKHARDT'S semi-diameter of the Moon, which has been used in the reductions of the published observations (with some modifications), has been corrected to satisfy the elements given by Professor HANSEN in his *Tables of the Moon*, page 399. The latter agrees so closely with modern observations, that, in the equations of condition in the following section, I have assumed it to be perfectly accurate. The residual errors, arising from this circumstance, are likely to be exceedingly small, and inappreciable in the final result.

The remaining parts of the calculations are explained in the formation of the equations of condition in the following section.

SECTION I. *Comparison of the Moon's Horizontal Equatoreal Parallax, from BURCKHARDT'S Tables, with that deduced from the formulæ of Professor ADAMS.*

For Mean Noon.

| Year and Day.    | Moon's Hor. Eq. Parallax, from Berlin Ephemeris. | Seconds of Adams. | Correction of Berlin Ephemeris. | Year and Day.   | Moon's Hor. Eq. Parallax, from Berlin Ephemeris. | Seconds of Adams. | Correction of Berlin Ephemeris. |
|------------------|--|-------------------|---------------------------------|-----------------|--|-------------------|---------------------------------|
| 1830.<br>April 2 | 55' 31" 30                                       | 34' 93            | + 3' 63                         | 1832.<br>July 9 | 54' 27" 80                                       | 29' 39            | + 1' 59                         |
| 3                | 54 59' 40  | 62' 35            | + 2' 95                         | 20              | 56 51' 00  | 53' 39            | + 2' 39                         |
| 4                | 54 34' 40  | 36' 97            | + 2' 57                         | 21              | 57 40' 80  | 43' 28            | + 2' 48                         |
| 5                | 54 15' 70  | 18' 31            | + 2' 61                         | Aug. 10         | 54 4' 70   | 8' 01             | + 3' 31                         |
| 6                | 54 3' 50   | 5' 84             | + 2' 34                         | 11              | 54 15' 80  | 19' 08            | + 3' 28                         |
| 7                | 53 56' 50  | 59' 16            | + 2' 66                         | 12              | 54 31' 90  | 34' 88            | + 2' 98                         |
| 8                | 53 54' 80  | 57' 73            | + 2' 93                         | Sept. 30        | 54 51' 20  | 53' 33            | + 2' 13                         |
| 30               | 55 31' 20  | 36' 13            | + 4' 93                         | Oct. 1          | 54 27' 70  | 30' 22            | + 2' 52                         |
| May 1            | 54 55' 90  | 59' 93            | + 4' 03                         | 12              | 58 10' 40  | 8' 19             | — 2' 21                         |
| 2                | 54 28' 90  | 32' 14            | + 3' 24                         | 13              | 58 33' 10  | 30' 82            | — 2' 28                         |
| 3                | 54 10' 70  | 13' 40            | + 2' 70                         | Nov. 2          | 54 41' 10  | 44' 13            | + 3' 03                         |
| 4                | 54 0' 50   | 3' 00             | + 2' 50                         | 3               | 55 10' 00  | 12' 86            | + 2' 86                         |
| 5                | 53 57' 30  | 59' 99            | + 2' 69                         | 6               | 57 13' 60  | 14' 40            | + 0' 80                         |
| 6                | 54 0' 30   | 3' 35             | + 3' 05                         | 7               | 57 56' 90  | 56' 94            | + 0' 04                         |
| Aug. 3           | 57 36' 90  | 36' 82            | — 0' 08                         | 16              | 58 35' 50  | 36' 82            | + 1' 32                         |
| 4                | 58 16' 50  | 15' 93            | — 0' 57                         | 17              | 58 10' 80  | 13' 09            | + 2' 29                         |
| 5                | 58 50' 20  | 49' 02            | — 1' 18                         | Dec. 15         | 57 51' 80  | 53' 05            | + 1' 25                         |
| 6                | 59 15' 30  | 13' 94            | — 1' 36                         | 16              | 57 13' 50  | 15' 66            | + 2' 16                         |
| 1832.<br>May 18  | 54 7' 10   | 8' 85             | + 1' 75                         | 1833.<br>Jan. 6 | 61 10' 70  | 11' 77            | + 1' 07                         |
| 19               | 54 5' 50   | 7' 29             | + 1' 79                         | 7               | 61 13' 80  | 15' 24            | + 1' 44                         |
| 20               | 54 12' 00  | 14' 23            | + 2' 23                         | 28              | 56 16' 90  | 16' 49            | — 0' 41                         |
| June 10          | 55 9' 50   | 10' 46            | + 0' 96                         | 29              | 57 8' 20   | 6' 30             | — 1' 90                         |
| 11               | 54 45' 50  | 47' 04            | + 1' 54                         | 30              | 58 3' 90   | 1' 81             | — 2' 09                         |
| July 8           | 54 51' 10  | 52' 16            | + 1' 06                         | 31              | 58 62' 10  | 59' 43            | — 2' 67                         |

*Moon's Horizontal Equatoreal Parallax.*

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For Mean Noon.

| Year and Day. | Moon's Hor. Eq. Parallax, from Berlin Ephemeris. | Seconds of Adams. | Correction of Berlin Ephemeris. | Year and Day. | Moon's Hor. Eq. Parallax, from Nautical Almanac. | Seconds of Adams. | Correction of Nautical Almanac. |
|---------------|--|-------------------|---------------------------------|---------------|--|-------------------|---------------------------------|
| 1833.         |  |                   |                                 | 1834.         |  |                   |                                 |
| Feb. 1        | 59 56'70   | 54'51             | -2'19                           | June 19       | 59 1'50  | 2'67              | +1'17                           |
| 2             | 60 42'60   | 41'31             | -1'29                           | 20            | 58 34'60   | 36'02             | +1'42                           |
| 3             | 61 14'10   | 14'10             | 0'00                            | 21            | 58 0'40  | 1'91              | +1'51                           |
| 4             | 61 27'30   | 28'47             | +1'17                           | 22            | 57 21'50   | 22'66             | +1'16                           |
| 28            | 58 37'40   | 34'46             | -2'94                           | 23            | 56 40'40   | 41'20             | +0'80                           |
| Mar. 1        | 59 26'80   | 23'19             | -3'61                           | 30            | 54 21'90   | 22'55             | +0'65                           |
| 4             | 61 4'80  | 3'39              | -1'41                           | July 1        | 54 38'90   | 39'94             | +1'04                           |
| 5             | 61 6'80  | 6'81              | +0'01                           | 14            | 59 4'80  | 7'66              | +2'86                           |
| 6             | 60 50'20   | 51'35             | +1'15                           | 15            | 58 49'80   | 52'52             | +2'72                           |
| 7             | 60 16'50   | 18'78             | +2'28                           | 16            | 58 31'00   | 33'15             | +2'15                           |
| 28            | 58 26'30   | 25'35             | -0'95                           | Aug. 22       | 54 10'20   | 10'83             | +0'63                           |
| 29            | 59 2'20  | 0'22              | -1'98                           | 23            | 54 4'40  | 4'85              | +0'45                           |
| 31            | 59 62'30   | 59'04             | -3'26                           | Sept. 11      | 57 10'30   | 10'25             | -0'05                           |
| April 1       | 60 19'30   | 16'28             | -3'02                           | 12            | 56 29'70   | 30'15             | +0'45                           |
| 2             | 60 23'70   | 21'49             | -2'21                           | 13            | 55 53'70   | 54'53             | +0'83                           |
| 3             | 60 13'60   | 12'72             | -0'88                           | Oct. 13       | 54 39'30   | 39'27             | -0'03                           |
| 4             | 59 49'20   | 49'68             | +0'48                           | 14            | 54 18'90   | 19'46             | +0'56                           |
| 5             | 59 12'90   | 14'16             | +1'26                           | 15            | 54 5'40  | 6'19              | +0'79                           |
| 6             | 58 26'90   | 29'28             | +2'38                           | 16            | 53 57'70   | 59'39             | +1'69                           |
| 26            | 58 59'00   | 59'87             | +0'87                           | 17            | 53 55'50   | 56'84             | +1'34                           |
| 27            | 59 14'90   | 15'13             | +0'23                           | Nov. 10       | 54 35'90   | 35'25             | -0'65                           |
| 28            | 59 26'80   | 26'19             | -0'61                           | 11            | 54 15'50   | 15'14             | -0'36                           |
| 29            | 59 32'50   | 30'96             | -1'54                           | 12            | 54 3'70  | 3'68              | -0'02                           |
| 30            | 59 30'40   | 28'80             | -1'60                           | 13            | 53 59'40   | 60'01             | +0'61                           |
| May 1         | 59 19'10   | 18'08             | -1'02                           | 15            | 54 10'40   | 11'76             | +1'36                           |
| 3             | 58 29'20   | 29'92             | +0'72                           | 16            | 54 23'70   | 25'31             | +1'61                           |
| 4             | 57 52'60   | 54'61             | +2'01                           | Dec. 10       | 54 8'20  | 8'53              | +0'33                           |
| 5             | 57 12'10   | 14'65             | +2'55                           | 11            | 54 6'90  | 7'33              | +0'43                           |
| 11            | 54 14'30   | 16'75             | +2'45                           | 12            | 54 13'80   | 14'78             | +0'98                           |
| 12            | 54 14'40   | 16'37             | +1'97                           | 13            | 54 27'80   | 29'36             | +1'56                           |
|               |  |                   |                                 | 14            | 54 47'20   | 49'49             | +2'29                           |
|               |  |                   |                                 | 1836.         |  |                   |                                 |
|               |  |                   |                                 | Jan. 3        | 54 18'40   | 21'37             | +2'97                           |

## Mr. BREEN, on the Constant of the

For Mean Noon.

| Year and Day. | Moon's Hor. Eq. Parallax, from Nautical Almanac. | Seconds of Adams. | Correction of Nautical Almanac. | Year and Day. | Moon's Hor. Eq. Parallax, from Nautical Almanac. | Seconds of Adams. | Correction of Nautical Almanac. |
|---------------|--|-------------------|---------------------------------|---------------|--|-------------------|---------------------------------|
| 1836.         |  |                   |                                 | 1836.         |  |                   |                                 |
| Jan. 4        | 54' 35" 20                                       | 37" 86            | + 2" 66                         | June 30       | 60' 49" 70                                       | 52" 44            | + 2" 74                         |
| 7             | 55 48 20   | 49 39             | + 1 19                          | July 23       | 59 24 80   | 27 37             | + 2 57                          |
| 8             | 56 19 80   | 20 51             | + 0 71                          | 24            | 60 5 90  | 9 00              | + 3 10                          |
| Feb. 26       | 54 18 40   | 20 07             | + 1 67                          | 26            | 60 55 20   | 59 70             | + 4 50                          |
| 27            | 54 34 80   | 36 04             | + 1 24                          | 27            | 60 56 30   | 60 35             | + 4 05                          |
| 29            | 55 29 60   | 31 17             | + 1 57                          | Aug. 22       | 59 55 30   | 60 67             | + 5 37                          |
| Mar. 1        | 56 3 90  | 6 21              | + 2 31                          | 23            | 60 9 50  | 15 26             | + 5 76                          |
| 6             | 58 38 80   | 42 39             | + 3 59                          | Sept. 20      | 59 23 20   | 29 03             | + 5 83                          |
| 7             | 58 55 20   | 58 41             | + 3 21                          | 21            | 59 18 70   | 24 91             | + 6 21                          |
| 8             | 59 6 00  | 8 56              | + 2 56                          | 23            | 58 44 70   | 51 65             | + 6 95                          |
| 9             | 59 11 40   | 13 46             | + 2 06                          | 24            | 58 15 90   | 22 58             | + 6 68                          |
| 25            | 54 20 90   | 22 03             | + 1 13                          | Oct. 18       | 58 54 40   | 57 87             | + 3 47                          |
| 26            | 54 39 90   | 40 33             | + 0 43                          | 19            | 58 36 40   | 40 87             | + 4 47                          |
| 27            | 55 8 70  | 8 40              | - 0 30                          | 20            | 58 15 10   | 19 86             | + 4 76                          |
| 30            | 57 13 00   | 13 23             | + 0 23                          | 21            | 57 50 50   | 56 41             | + 5 91                          |
| 31            | 57 57 60   | 59 00             | + 1 40                          | 22            | 57 22 90   | 29 02             | + 6 12                          |
| April 1       | 58 38 10   | 40 53             | + 2 43                          | 23            | 56 52 90   | 58 80             | + 5 90                          |
| 2             | 59 11 40   | 14 64             | + 3 24                          | 24            | 56 21 30   | 26 77             | + 5 47                          |
| 24            | 55 7 40  | 6 78              | - 0 62                          | 25            | 55 49 70   | 54 25             | + 4 55                          |
| 25            | 55 47 10   | 45 61             | - 1 49                          | Nov. 19       | 56 38 30   | 41 90             | + 3 60                          |
| 26            | 56 34 20   | 32 00             | - 2 20                          | 20            | 56 8 60  | 12 33             | + 4 33                          |
| 27            | 57 26 20   | 24 26             | - 1 94                          | Dec. 15       | 57 37 10   | 40 14             | + 3 04                          |
| 28            | 58 19 70   | 18 21             | - 1 49                          | 16            | 56 52 70   | 55 40             | + 2 70                          |
| 29            | 59 9 70  | 9 49              | - 0 21                          | 19            | 55 9 00  | 11 49             | + 2 49                          |
| 30            | 59 52 10   | 53 19             | + 1 09                          | 20            | 54 45 10   | 47 04             | + 1 94                          |
| May 2         | 60 37 90   | 41 33             | + 3 43                          | 23            | 54 1 70  | 2 92              | + 1 22                          |
| 3             | 60 37 30   | 41 47             | + 4 17                          | 24            | 53 57 10   | 57 66             | + 0 56                          |
| June 24       | 58 59 50   | 59 12             | - 0 38                          | 1837. Feb. 14 | 54 28 90   | 30 33             | + 1 43                          |
| 25            | 59 52 30   | 52 73             | + 0 43                          | 15            | 54 11 00   | 11 95             | + 0 95                          |
| 26            | 60 36 40   | 37 37             | + 0 97                          | 16            | 54 1 70  | 1 78              | + 0 08                          |
| 27            | 61 7 40  | 9 06              | + 1 66                          | 17            | 53 59 80   | 60 15             | + 0 35                          |
| 29            | 61 14 60   | 17 42             | + 2 82                          | 21            | 54 49 90   | 52 10             | + 2 20                          |

*Moon's Horizontal Equatoreal Parallax.*

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For Mean Noon.

| Year and Day.    | Moon's Hor. Eq. Parallax, from Nautical Almanac. | Seconds of Adams. | Correction of Nautical Almanac. | Year and Day.    | Moon's Hor. Eq. Parallax, from Nautical Almanac. | Seconds of Adams. | Correction of Nautical Almanac. |
|------------------|--|-------------------|---------------------------------|------------------|--|-------------------|---------------------------------|
| 1837.<br>Feb. 22 | 55' 13"00  | 15"55             | +2"55                           | 1837.<br>Aug. 10 | 57' 43"50  | 48"82             | +5"32                           |
| 23               | 55 39'70   | 41'90             | +2'20                           | 11               | 58 39'00   | 44'40             | +5'40                           |
| Mar. 18          | 54 18'30   | 18'39             | +0'09                           | 12               | 59 33'30   | 38'85             | +5'55                           |
| 19               | 54 34'40   | 35'23             | +0'83                           | 13               | 60 21'40   | 27'02             | +5'62                           |
| 20               | 54 56'00   | 57'70             | +1'70                           | 14               | 60 57'60   | 62'87             | +5'27                           |
| 21               | 55 21'30   | 24'29             | +2'99                           | Sept. 10         | 59 49'90   | 56'71             | +6'81                           |
| April 14         | 54 16'80   | 16'32             | -0'48                           | 11               | 60 25'40   | 32'35             | +6'95                           |
| 15               | 54 29'50   | 29'08             | -0'42                           | Oct. 9           | 59 44'40   | 50'88             | +6'48                           |
| 20               | 57 4'60  | 8'83              | +4'23                           | 10               | 60 2'50  | 8'89              | +6'39                           |
| 21               | 57 38'80   | 43'91             | +5'11                           | 11               | 60 9'70  | 15'71             | +6'01                           |
| May 25           | 59 30'90   | 36'25             | +5'35                           | 12               | 60 4'20  | 9'40              | +5'20                           |
| 26               | 59 10'40   | 15'19             | +4'79                           | 21               | 54 28'70   | 28'02             | -0'68                           |
| June 14          | 57 8'10  | 9'32              | +1'22                           | 22               | 54 14'30   | 14'25             | -0'05                           |
| 15               | 58 1'40  | 3'07              | +1'67                           | Nov. 12          | 57 53'70   | 56'46             | +2'76                           |
| 17               | 59 39'10   | 42'43             | +3'33                           | 13               | 57 16'50   | 18'22             | +1'72                           |
| 18               | 60 14'20   | 18'32             | +4'12                           | 16               | 55 21'50   | 20'93             | -0'57                           |
| 24               | 58 52'40   | 55'87             | +3'47                           | 17               | 54 51'20   | 50'48             | -0'72                           |
| 25               | 58 10'60   | 13'53             | +2'93                           | Dec. 8           | 57 58'10   | 59'78             | +1'68                           |
| July 11          | 56 10'70   | 13'44             | +2'74                           | 9                | 57 31'90   | 33'77             | +1'87                           |
| 12               | 57 2'20  | 5'00              | +2'80                           | 10               | 57 3'20  | 5'15              | +1'95                           |
| 13               | 57 58'30   | 61'48             | +3'18                           | 11               | 56 32'70   | 34'45             | +1'75                           |
| 14               | 58 55'80   | 59'13             | +3'33                           | 12               | 56 1'50  | 2'99              | +1'49                           |
| 15               | 59 49'10   | 52'71             | +3'61                           | 13               | 55 30'80   | 31'81             | +1'01                           |
| 16               | 60 33'00   | 37'00             | +4'00                           | 21               | 55 7'60  | 10'50             | +2'90                           |
| 17               | 61 2'60  | 6'67              | +4'07                           | 22               | 55 46'80   | 49'97             | +3'17                           |



SECTION II.—*Corrections applied to the Printed Observations.*FALLOWS' *Cape Observations*, 1830.*(Memoirs of the Royal Astronomical Society, vol. xix. pp. 97, 98.)*

The observations have been reduced in the manner explained in this Memoir, pp. 29, 34, adopting in the computation of the parallax a compression of  $\frac{1}{3\frac{1}{6}}$ . In these reductions, BURCKHARDT'S horizontal parallax and semi-diameter, interpolated from the *Berlin Ephemeris*, have been used.

The north polar distances of the Cape Catalogue, contained in the same Memoir, are *greater* than those of the first Cambridge Catalogue by  $0''.79$  (from a mean of 18 stars), and the north polar distances of the latter are *less* than the Greenwich Catalogue of 1439 stars by  $0''.64$ . The residual correction —  $0''.15$  has been neglected in the following reductions.

Professor HENDERSON'S *Cape Observations of 1832 and 1833.*

The apparent declinations given by Professor HENDERSON, at Greenwich, Cambridge, and the Cape, have been obtained by comparison of the same standard catalogue in the determination of index errors, adopting in all BESSEL'S Tables of Refraction. The results have been carefully made, and have been used with the additional application of Professor AIRY'S parallax correction for the Moon's Limb. The only difference of magnitude from the printed observations, is the Cambridge observation of the Moon, 1833, February 28, which arises from an estimation of the change of index error.

*Cape Observations of 1834, 1836, and 1837.*

The Cape Observations of the year 1834 have been perfectly reduced (in the manner explained by THOMAS MACLEAR, Esq.), using in the computations of this year, as well as 1836 and 1837, the *Nautical Almanac* horizontal parallax and semi-diameter of the Moon (uncorrected). The Observations of the years 1836 and 1837, require, however, the additional correction arising from the discordance of the direct and reflexion results, which I had approximately deduced from simultaneous direct, and reflexion observations, but, in consequence of the faulty nature of the mounting of the Cape circle, I considered it to be more advisable in these years to determine the residual corrections by index errors of stars in the same parallel as the Moon (principally Moon culminators). The results of this comparison are contained in the following pages, in which the tabular places of the stars have been taken from the Greenwich Catalogues.

| Year and Day.    | Star's Name.              | Apparent Observed South Polar Distance (corrected). | Seconds of Tabular S.P.D. | Correction to Observed S.P.D. | Adopted Correction for the Moon. |
|------------------|---------------------------|---|---------------------------|-------------------------------|----------------------------------|
| 1834.<br>June 19 | Spica                     | 79° 42' 20" 28                                      | 21' 04                    | +0' 76                        | } "                              |
|                  | α <sup>2</sup> Libræ      | 74 39 7' 83   | 3' 67                     | -4' 16                        |                                  |
|                  | Antares                   | 63 56 34' 08  | 32' 67                    | -1' 41                        |                                  |
| June 20          | α <sup>2</sup> Libræ      | 74 39 4' 29   | 3' 68                     | -0' 61                        | } -0' 41                         |
|                  | Antares                   | 63 56 32' 84  | 32' 63                    | -0' 21                        |                                  |
| June 22          | Spica                     | 79 42 20' 35  | 21' 17                    | +0' 82                        | } -0' 09                         |
|                  | α <sup>2</sup> Libræ      | 74 39 3' 97   | 3' 72                     | -0' 25                        |                                  |
|                  | Antares                   | 63 56 33' 38  | 32' 55                    | -0' 83                        |                                  |
| June 30          | α Ceti                    | 93 26 4' 68   | 4' 37                     | -0' 31                        | } -1' 33                         |
|                  | Rigel                     | 81 36 5' 55   | 4' 43                     | -1' 12                        |                                  |
|                  | α Orionis                 | 97 22 11' 82  | 9' 26                     | -2' 56                        |                                  |
| July 14          | Spica                     | 79 42 21' 54  | 22' 29                    | +0' 75                        | } +0' 57                         |
|                  | α <sup>2</sup> Libræ      | 74 39 3' 87   | 4' 26                     | +0' 39                        |                                  |
| July 15          | Spica                     | 79 42 21' 73  | 22' 36                    | +0' 63                        | } +0' 39                         |
|                  | α <sup>2</sup> Libræ      | 74 39 3' 25   | 4' 30                     | +1' 05                        |                                  |
|                  | Antares                   | 63 56 32' 32  | 31' 80                    | -0' 52                        |                                  |
| Aug. 22          | Spica                     | 79 42 22' 79  | 24' 61                    | +1' 82                        | } +0' 49                         |
|                  | α <sup>2</sup> Libræ      | 74 39 6' 69   | 5' 85                     | -0' 84                        |                                  |
| Sept. 11         | Antares                   | 63 56 33' 43  | 31' 93                    | -1' 50                        | } -1' 41                         |
|                  | μ' Sagittarii             | 68 54 19' 95  | 18' 64                    | -1' 31                        |                                  |
| Sept. 12         | α <sup>2</sup> Capricorni | 76 56 54' 43  | 54' 16                    | -0' 27                        | } -0' 56                         |
|                  | Fomalhaut                 | 59 30 12' 50  | 11' 66                    | -0' 84                        |                                  |
| Oct. 16          | α Arietis                 | 112 40 39' 79                                       | 40' 27                    | +0' 48                        | } +1' 32                         |
|                  | Aldebaran                 | 106 10 13' 96                                       | 16' 12                    | +2' 16                        |                                  |
| Nov. 12          | f Piscium                 | 92 44 33' 45  | 34' 29                    | +0' 84                        | } +1' 19                         |
|                  | μ Piscium                 | 95 17 23' 82  | 24' 64                    | +0' 82                        |                                  |
|                  | α Arietis                 | 112 40 40' 48                                       | 42' 79                    | +2' 31                        |                                  |
|                  | Rigel                     | 81 36 10' 65  | 11' 45                    | +0' 80                        |                                  |

| Year and Day.    | Star's Name.         | Apparent Observed South Polar Distance (corrected). | Seconds of Tabular S.P.D. | Correction to Observed S.P.D. | Adopted Correction for the Moon. |
|------------------|----------------------|---|---------------------------|-------------------------------|----------------------------------|
| 1834.<br>Nov. 15 | $\mu$ Ceti           | 99° 24' 43" 21                                      | 46" 21                    | +3" 00                        | +1' 61                           |
|                  | $\lambda$ Ceti       | 98 14 40 98   | 41' 42                    | +0' 44                        |                                  |
|                  | $\xi$ Tauri          | 99 9 6 18   | 8' 42                     | +2' 24                        |                                  |
|                  | $\epsilon$ Tauri     | 100 37 47 26  | 48' 04                    | +0' 78                        |                                  |
| Dec. 10          | $\epsilon$ Piscium   | 94 46 22 95   | 26' 02                    | +3' 07                        | +1' 37                           |
|                  | $\nu$ Piscium        | 94 38 54 95   | 56' 11                    | +1' 16                        |                                  |
|                  | $\epsilon$ Tauri     | 100 37 47 37  | 47' 24                    | -0' 13                        |                                  |
| Dec. 11          | $\nu$ Piscium        | 94 38 54 43   | 55' 05                    | +0' 62                        | +0' 34                           |
|                  | $\circ$ Piscium      | 98 19 25 23   | 24' 22                    | -1' 01                        |                                  |
|                  | $\nu$ Ceti           | 94 52 5' 61   | 6' 24                     | +0' 63                        |                                  |
|                  | $\mu$ Ceti           | 99 24 44 34   | 45' 45                    | +1' 11                        |                                  |
| Dec. 13          | $\xi$ Tauri          | 99 9 5' 47  | 7' 35                     | +1' 88                        | +1' 14                           |
|                  | $\epsilon$ Tauri     | 100 37 45 65  | 47' 12                    | +1' 47                        |                                  |
|                  | $\gamma$ Tauri       | 105 13 21 92  | 22' 36                    | +0' 44                        |                                  |
|                  | $\delta'$ Tauri      | 107 8 56 10   | 56' 86                    | +0' 76                        |                                  |
| 1836.<br>Jan. 3  | $\alpha$ Orionis     | 97 22 14 74   | 13' 71                    | -1' 03                        | -0' 81                           |
|                  | $\mu$ Geminorum      | 112 35 29 50  | 29' 37                    | -0' 13                        |                                  |
|                  | $\delta$ Geminorum   | 112 16 42 95  | 41' 68                    | -1' 27                        |                                  |
| Jan. 7           | $\epsilon$ Leonis    | 114 31 32 53  | 31' 71                    | -0' 82                        | -1' 78                           |
|                  | $\gamma$ Leonis      | 110 40 5' 02  | 4' 23                     | -0' 79                        |                                  |
|                  | $\chi$ Leonis        | 98 13 19 31   | 16' 49                    | -2' 82                        |                                  |
|                  | $\pi$ Leonis         | 104 12 3' 64  | 0' 94                     | -2' 70                        |                                  |
| Feb. 26          | $\alpha$ Orionis     | 97 22 10 81   | 11' 10                    | +0' 29                        | +0' 86                           |
|                  | H Geminorum          | 113 15 56 71  | 58' 01                    | +1' 30                        |                                  |
|                  | $\epsilon$ Geminorum | 115 17 14 39  | 15' 39                    | +1' 00                        |                                  |
| Feb. 29          | $\epsilon$ Cancri    | 110 59 36 46  | 35' 91                    | -0' 55                        | -2' 34                           |
|                  | $\gamma$ Cancri      | 112 3 12 78   | 9' 90                     | -2' 88                        |                                  |
|                  | $\lambda$ Leonis     | 113 41 16 58  | 12' 98                    | -3' 60                        |                                  |

| Year and Day.   | Star's Name.         | Apparent Observed South Polar Distance. | Seconds of Tabular S.P.D. | Correction to Observed S.P.D. | Adopted Correction for the Moon. |
|-----------------|----------------------|---|---------------------------|-------------------------------|----------------------------------|
| 1836.<br>Mar. 6 | $\mu$ Libræ          | 76° 32' 13" 90                          | 12' 35                    | -1' 55                        | } +0' 62                         |
|                 | $\xi^2$ Libræ        | 79 15 15' 52                            | 18' 30                    | +2' 78                        |                                  |
| Mar. 8          | $\pi$ Libræ          | 74 51 13' 52                            | 12' 34                    | -1' 18                        | } -1' 40                         |
|                 | $\theta$ Libræ       | 73 45 23' 17                            | 22' 17                    | -1' 00                        |                                  |
|                 | $\tau$ Scorpii       | 62 7 51' 16                             | 49' 36                    | -1' 80                        |                                  |
|                 | 25 Scorpii           | 64 46 35' 22                            | 33' 59                    | -1' 63                        |                                  |
| Mar. 26         | $\delta$ Geminorum   | 112 16 44' 65                           | 45' 75                    | +1' 10                        | } -1' 24                         |
|                 | $\epsilon$ Geminorum | 118 7 9' 58                             | 8' 13                     | -1' 45                        |                                  |
|                 | 6 Cancri             | 118 14 60' 17                           | 58' 01                    | -2' 16                        |                                  |
|                 | $\lambda$ Cancri     | 114 32 5' 38                            | 2' 91                     | -2' 47                        |                                  |
| Mar. 30         | $k$ Leonis           | 105 3 30' 38                            | 27' 85                    | -2' 53                        | } -0' 78                         |
|                 | $\chi$ Leonis        | 98 13 12' 69                            | 10' 73                    | -1' 96                        |                                  |
|                 | $\nu$ Virginis       | 97 26 45' 57                            | 46' 97                    | +1' 40                        |                                  |
|                 | $b$ Virginis         | 94 34 0' 10                             | 0' 08                     | -0' 02                        |                                  |
| Mar. 31         | $\nu$ Virginis       | 97 26 43' 89                            | 46' 98                    | +3' 09                        | } +2' 50                         |
|                 | $c$ Virginis         | 94 13 25' 62                            | 27' 54                    | +1' 92                        |                                  |
| April 24        | $\lambda$ Leonis     | 113 41 19' 80                           | 13' 78                    | (-6' 02)                      | } -3' 00                         |
|                 | $\psi$ Leonis        | 104 46 9' 01                            | 6' 01                     | -3' 00                        |                                  |
| April 25        | $\alpha$ Orionis     | 97 22 12' 57                            | 11' 90                    | -0' 67                        | } -1' 16                         |
|                 | $\psi$ Leonis        | 104 46 7' 65                            | 6' 01                     | -1' 64                        |                                  |
|                 | Spica                | 79 41 36' 38                            | 38' 88                    | (+2' 50)                      |                                  |
| April 26        | $\sigma$ Leonis      | 96 55 33' 65                            | 32' 83                    | -0' 82                        | } -0' 65                         |
|                 | $\tau$ Leonis        | 93 45 26' 20                            | 25' 72                    | -0' 48                        |                                  |
| April 27        | $\sigma$ Leonis      | 96 55 32' 89                            | 32' 87                    | -0' 02                        | } +0' 52                         |
|                 | $\bullet$ Virginis   | 99 38 33' 14                            | 34' 20                    | +1' 06                        |                                  |
| April 28        | $\bullet$ Virginis   | 99 38 32' 70                            | 34' 26                    | +1' 56                        | } +1' 19                         |
|                 | $\delta$ Virginis    | 94 17 16' 22                            | 16' 33                    | +0' 11                        |                                  |
|                 | $\theta$ Virginis    | 85 20 7' 08                             | 8' 97                     | +1' 89                        |                                  |

| Year and Day.     | Star's Name.           | Apparent Observed South Polar Distance. | Seconds of Tabular S.P.D. | Correction to Observed S.P.D. | Adopted Correction for the Moon. |
|-------------------|------------------------|---|---------------------------|-------------------------------|----------------------------------|
| 1836.<br>April 29 | $\delta$ Virginis      | 94° 17' 17" 07                          | 16" 39                    | -0" 68                        | } +0.50                          |
|                   | $\alpha$ Virginis      | 80 29 23.06                             | 24.73                     | +1.67                         |                                  |
| May 2             | Spica                  | 79 41 35.09                             | 38.73                     | +3.64                         | } +0.95                          |
|                   | Fomalhaut              | 59 30 41.87                             | 40.12                     | -1.75                         |                                  |
| June 24           | $\alpha$ Virginis      | 80 29 25.28                             | 25.83                     | +0.55                         | } +0.39                          |
|                   | $\alpha^2$ Libræ       | 74 38 27.84                             | 28.06                     | +0.22                         |                                  |
| June 26           | $\tau$ Scorpii         | 62 7 43.09                              | 41.69                     | -1.40                         | -1.40                            |
| June 28           | $\delta$ Sagittarii    | 60 6 32.94                              | 31.95                     | -0.99                         | } -0.63                          |
|                   | $\phi$ Sagittarii      | 62 50 50.46                             | 49.98                     | -0.48                         |                                  |
|                   | $\tau$ Sagittarii      | 62 5 49.73                              | 49.37                     | -0.36                         |                                  |
|                   | $\lambda^2$ Sagittarii | 64 45 42.46                             | 41.22                     | -1.24                         |                                  |
| June 29           | $\lambda^2$ Sagittarii | 64 45 41.29                             | 41.23                     | -0.06                         | } +0.64                          |
| July 23           | $\gamma$ Libræ         | 75 45 36.27                             | 36.86                     | +0.59                         |                                  |
|                   | $\sigma$ Scorpii       | 64 48 14.56                             | 15.76                     | +1.20                         |                                  |
|                   | Antares                | 63 56 8.57                              | 8.69                      | +0.12                         |                                  |
| July 26           | $\epsilon$ Sagittarii  | 55 32 40.51                             | 39.84                     | -0.67                         | } -0.06                          |
|                   | $\lambda$ Sagittarii   | 64 29 38.36                             | 37.54                     | -0.82                         |                                  |
|                   | $\sigma$ Sagittarii    | 63 30 21.82                             | 23.13                     | +1.31                         |                                  |
| Aug. 22           | $\epsilon$ Scorpii     | 56 0 30.07                              | 28.35                     | -1.72                         | } -1.70                          |
|                   | $\epsilon$ Sagittarii  | 55 32 36.73                             | 33.98                     | -2.75                         |                                  |
|                   | $\alpha^2$ Capricorni  | 76 57 9.82                              | 12.27                     | (+2.45)                       |                                  |
|                   | Fomalhaut              | 59 30 52.38                             | 51.74                     | -0.64                         |                                  |
| Sept. 20          | $\epsilon$ Sagittarii  | 61 50 23.81                             | 25.37                     | +1.56                         | } +1.50                          |
|                   | $\alpha^2$ Capricorni  | 76 57 10.38                             | 12.06                     | +1.68                         |                                  |
|                   | $\alpha$ Capricorni    | 69 30 8.87                              | 9.97                      | +1.10                         |                                  |
|                   | $\zeta$ Capricorni     | 66 53 2.04                              | 3.70                      | +1.66                         |                                  |
| Sept. 23          | $\phi$ Aquarii         | 83 4 18.19                              | 21.14                     | +2.95                         | } +3.61                          |
|                   | $p$ Piscium            | 85 32 16.40                             | 20.67                     | +4.27                         |                                  |

| Year and Day.    | Star's Name. | Apparent Observed South Polar Distance. | Seconds of Tabular S.P.D. | Correction to Observed S.P.D. | Adopted Correction for the Moon. |
|------------------|--------------|---|---------------------------|-------------------------------|----------------------------------|
| 1836.<br>Oct. 18 | ♄ Capricorni | 64° 8' 40" 91                           | 42" 66                    | +1" 75                        | } "                              |
|                  | ♅ Capricorni | 69 30 7' 28                             | 8' 30                     | +1' 02                        |                                  |
|                  | ♆ Capricorni | 72 36 9' 01                             | 9' 13                     | +0' 12                        |                                  |
|                  | ♇ Capricorni | 73 8 0' 20                              | 3' 16                     | +2' 96                        |                                  |
| Oct. 19          | ♈ Capricorni | 72 36 8' 48                             | 9' 07                     | +0' 59                        | } +0' 52                         |
|                  | ♁ Aquarii    | 75 32 48' 59                            | 49' 03                    | +0' 44                        |                                  |
| Oct. 20          | ♁ Aquarii    | 75 32 46' 63                            | 48' 96                    | +2' 33                        | } +2' 71                         |
|                  | ♂ Aquarii    | 73 18 39' 94                            | 43' 18                    | +3' 24                        |                                  |
|                  | ♂ Aquarii    | 79 29 49' 01                            | 52' 04                    | +3' 03                        |                                  |
|                  | ♈ Piscium    | 86 19 51' 93                            | 54' 19                    | +2' 26                        |                                  |
| Oct. 21          | ♈ Piscium    | 86 19 52' 48                            | 54' 16                    | +1' 68                        | } +1' 82                         |
|                  | ♉ Piscium    | 91 2 8' 45                              | 10' 40                    | +1' 95                        |                                  |
| Oct. 22          | ♉ Piscium    | 91 2 7' 92                              | 10' 39                    | +2' 47                        | } +2' 26                         |
|                  | ♊ Piscium    | 94 47 7' 53                             | 9' 58                     | +2' 05                        |                                  |
| Oct. 23          | ♊ Piscium    | 94 47 6' 33                             | 9' 58                     | +3' 25                        | +3' 25                           |
| Oct. 24          | ♈ Ceti       | 98 4 43' 83                             | 46' 90                    | +3' 07                        | } +2' 09                         |
|                  | ♈ Arietis    | 106 46 58' 02                           | 59' 13                    | +1' 11                        |                                  |
| Nov. 19          | ♈ Ceti       | 87 58 9' 09                             | 7' 19                     | (-1' 90)                      | } +3' 07                         |
|                  | ♈ Piscium    | 97 0 37' 94                             | 40' 17                    | +2' 23                        |                                  |
|                  | ♈ Piscium    | 98 20 3' 22                             | 7' 13                     | +3' 91                        |                                  |
| Dec. 15          | Spica        | 79 41 35' 27                            | 36' 79                    | +1' 52                        | +1' 52                           |
| Dec. 19          | ♈ Arietis    | 110 41 5' 83                            | 7' 34                     | +1' 51                        | } +1' 62                         |
|                  | ♈ Arietis    | 109 6 24' 23                            | 24' 17                    | -0' 06                        |                                  |
|                  | ♈ Tauri      | 111 37 53' 12                           | 55' 82                    | +2' 70                        |                                  |
|                  | ♈ Tauri      | 110 10 20' 26                           | 22' 58                    | +2' 32                        |                                  |
| Dec. 23          | ♈ Geminorum  | 115 17 10' 69                           | 12' 29                    | +1' 60                        | } +1' 63                         |
|                  | Pollux       | 118 24 50' 17                           | 51' 82                    | +1' 65                        |                                  |

| Year and Day.    | Star's Name. | Apparent Observed South Polar Distance. | Seconds of Tabular S.P.D. | Correction to Observed S.P.D. | Adopted Correction for the Moon. |
|------------------|--------------|---|---------------------------|-------------------------------|----------------------------------|
| 1837.<br>Feb. 14 | C Tauri      | 117° 34' 7".23                          | 6".51                     | -0".72                        | } -0".20                         |
|                  | α Geminorum  | 112 32 55".24                           | 55".56                    | +0".32                        |                                  |
| Feb. 15          | C Tauri      | 117 34 7".63                            | 6".46                     | -1".17                        | } -1".20                         |
|                  | α Geminorum  | 112 32 56".19                           | 55".58                    | -0".61                        |                                  |
|                  | ε Geminorum  | 115 17 14".63                           | 13".87                    | -0".76                        |                                  |
|                  | τ Geminorum  | 120 30 27".85                           | 25".58                    | -2".27                        |                                  |
| Feb. 16          | ε Geminorum  | 115 17 13".71                           | 13".90                    | +0".19                        | } +0".08                         |
|                  | τ Geminorum  | 120 30 25".60                           | 25".65                    | +0".05                        |                                  |
|                  | β Geminorum  | 118 24 53".65                           | 53".81                    | +0".16                        |                                  |
|                  | φ Geminorum  | 117 10 56".94                           | 56".87                    | -0".07                        |                                  |
| Feb. 21          | χ Leonis     | 98 12 52".38                            | 50".73                    | -1".65                        | } +0".15                         |
|                  | ι Leonis     | 101 25 30".19                           | 29".16                    | -1".03                        |                                  |
|                  | β Virginis   | 92 40 51".02                            | 52".54                    | +1".52                        |                                  |
|                  | α Virginis   | 99 38 9".36                             | 11".12                    | +1".76                        |                                  |
| Feb. 22          | γ Virginis   | 89 26 36".40                            | 36".19                    | -0".21                        | } 0".00                          |
|                  | δ Virginis   | 94 16 54".78                            | 54".99                    | +0".21                        |                                  |
| Mar. 18          | γ Cancrī     | 112 3 3".26                             | 1".48                     | -1".78                        | } -1".18                         |
|                  | q Cancrī     | 108 23 33".11                           | 32".35                    | -0".76                        |                                  |
|                  | π Leonis     | 98 49 21".54                            | 20".55                    | -0".99                        |                                  |
|                  | Regulus      | 102 45 (33".75)                         | 36".71                    | (+2".96)                      |                                  |
| Mar. 19          | π Leonis     | 98 49 22".69                            | 20".54                    | -2".15                        | } -2".46                         |
|                  | Regulus      | 102 45 38".58                           | 36".74                    | -1".84                        |                                  |
|                  | k Leonis     | 105 3 10".03                            | 7".53                     | -2".50                        |                                  |
|                  | c Leonis     | 96 58 29".74                            | 26".41                    | -3".33                        |                                  |
| Mar. 20          | γ Cancrī     | 112 3 4".84                             | 1".60                     | -3".24                        | } -0".20                         |
|                  | α Hydre      | 82 2 32".59                             | 34".35                    | +1".76                        |                                  |
|                  | β Virginis   | 92 40 50".03                            | 50".91                    | +0".88                        |                                  |

| Year and Day.     | Star's Name.          | Apparent Observed South Polar Distance. | Seconds of Tabular S.P.D. | Correction to Observed S.P.D. | Adopted Correction for the Moon. |
|-------------------|-----------------------|---|---------------------------|-------------------------------|----------------------------------|
| 1837.<br>April 14 | $\delta$ Cancri       | 108° 44' 58" 87                         | 58" 18                    | —0" 69                        | " } +1' 50                       |
|                   | $\epsilon$ Leonis     | 100 37 46' 01                           | 47' 90                    | +1' 89                        |                                  |
|                   | $\pi$ Leonis          | 98 49 17' 96                            | 21' 25                    | +3' 29                        |                                  |
| April 20          | $\lambda$ Virginis    | 77 22 43' 55                            | 45' 20                    | +1' 65                        | } +1' 41                         |
|                   | $\alpha^2$ Libræ      | 74 38 9' 79                             | 10' 96                    | +1' 17                        |                                  |
| May 25            | $\zeta$ Capricorni    | 66 53 14' 28                            | 15' 74                    | +1' 46                        | } —0' 63                         |
|                   | $\gamma$ Capricorni   | 72 36 20' 11                            | 19' 89                    | —0' 22                        |                                  |
|                   | $\theta$ Aquarii      | 81 24 27' 68                            | 27' 14                    | —0' 54                        |                                  |
|                   | $\epsilon$ Aquarii    | 78 29 29' 11                            | 25' 89                    | —3' 22                        |                                  |
| June 14           | $\lambda$ Virginis    | 77 22 43' 24                            | 44' 89                    | +1' 65                        | +1' 65                           |
| June 17           | Antares               | 63 55 58' 94                            | 58' 80                    | —0' 14                        | } —0' 12                         |
|                   | $\theta$ Ophiuchi     | 65 10 4' 40                             | 3' 92                     | —0' 48                        |                                  |
|                   | $p$ Sagittarii        | 62 14 12' 01                            | 12' 27                    | +0' 26                        |                                  |
| June 24           | $n$ Piscium           | 86 20 4' 59                             | 4' 50                     | —0' 09                        | } —0' 73                         |
|                   | $r$ Piscium           | 83 4 57' 25                             | 56' 82                    | —0' 43                        |                                  |
|                   | $m$ Ceti              | 87 58 19' 75                            | 17' 87                    | —1' 88                        |                                  |
|                   | $s$ Piscium           | 97 0 45' 91                             | 45' 38                    | —0' 53                        |                                  |
| July 11           | Spica                 | 79 41 18' 91                            | 19' 20                    | +0' 29                        | } +0' 02                         |
|                   | $\pi$ Virginis        | 80 29 7' 65                             | 6' 91                     | —0' 74                        |                                  |
|                   | $\lambda$ Virginis    | 77 22 45' 24                            | 45' 75                    | +0' 51                        |                                  |
| July 13           | $\alpha^2$ Libræ      | 74 38 12' 01                            | 10' 62                    | —1' 39                        | } —0' 28                         |
|                   | $20$ Libræ            | 65 21 33' 47                            | 33' 29                    | —0' 18                        |                                  |
|                   | $\pi$ Scorpïi         | 64 21 27' 15                            | 27' 10                    | —0' 05                        |                                  |
|                   | $\beta^1$ Scorpïi     | 70 38 35' 12                            | 35' 61                    | +0' 49                        |                                  |
| July 14           | $\gamma^2$ Sagittarii | 59 34 46' 50                            | 46' 51                    | +0' 01                        | } —2' 23                         |
|                   | $s$ Sagittarii        | 55 32 40' 68                            | 36' 21                    | —4' 47                        |                                  |
| July 15           | $A^1$ Ophiuchi        | 63 38 22' 52                            | 26' 45                    | +3' 93                        | } +1' 57                         |
|                   | $\gamma^2$ Sagittarii | 59 34 47' 26                            | 46' 46                    | —0' 80                        |                                  |



| Year and Day.    | Star's Name.            | Apparent Observed South Polar Distance. | Seconds of Tabular S.P.D. | Correction to Observed S.P.D. | Adopted Correction for the Moon. |
|------------------|-------------------------|---|---------------------------|-------------------------------|----------------------------------|
| 1837.<br>July 16 | $\gamma^2$ Sagittarii   | 59° 34' 45".78                          | 46".41                    | +0".63                        | } —0.38                          |
|                  | $\epsilon$ Sagittarii   | 55 32 39.12                             | 36.05                     | —3.07                         |                                  |
|                  | $\tau$ Sagittarii       | 62 5 51.67                              | 52.20                     | +0.53                         |                                  |
|                  | $\lambda^2$ Sagittarii  | 64 45 47.17                             | 47.58                     | +0.41                         |                                  |
| Aug. 10          | $\pi$ Libræ             | 70 51 1.91                              | 5.81                      | +3.90                         | } +1.04                          |
|                  | Antares                 | 63 55 57.72                             | 57.58                     | —0.14                         |                                  |
|                  | $\tau$ Scorpii          | 62 7 30.66                              | 30.03                     | —0.63                         |                                  |
| Aug. 11          | Antares                 | 63 55 57.82                             | 57.58                     | —0.24                         | } —1.04                          |
|                  | $\Delta^1$ Ophiuchi     | 63 38 25.24                             | 25.77                     | +0.53                         |                                  |
|                  | $\gamma^2$ Sagittarii R | 59 34 45.32                             | 45.03                     | (—0.29)                       |                                  |
|                  | $\epsilon$ Sagittarii   | 55 32 37.54                             | 34.12                     | —3.42                         |                                  |
| Aug. 12          | $\theta$ Ophiuchi       | 65 10 3.12                              | 2.64                      | —0.48                         | } —0.27                          |
|                  | $\phi$ Sagittarii       | 62 50 49.98                             | 49.93                     | —0.05                         |                                  |
| Aug. 13          | $\phi$ Sagittarii       | 62 50 50.77                             | 49.88                     | —0.89                         | } —0.44                          |
|                  | 59 Sagittarii           | 62 24 16.88                             | 16.89                     | +0.01                         |                                  |
| Sept. 10         | $\pi$ Sagittarii        | 68 43 22.10                             | 22.30                     | +0.20                         | } +0.29                          |
|                  | $\lambda^2$ Sagittarii  | 64 45 45.05                             | 45.50                     | +0.45                         |                                  |
|                  | $\pi$ Capricorni        | 71 15 35.92                             | 36.53                     | +0.61                         |                                  |
|                  | $\psi$ Capricorni       | 64 8 57.73                              | 57.63                     | —0.10                         |                                  |
| Oct. 9           | $\pi$ Capricorni        | 69 30 22.49                             | 22.81                     | +0.32                         | } —0.07                          |
|                  | $\zeta$ Capricorni      | 66 53 17.70                             | 17.90                     | +0.20                         |                                  |
|                  | $\epsilon$ Aquarii      | 75 20 44.23                             | 43.47                     | —0.76                         |                                  |
|                  | $\theta$ Aquarii        | 81 24 40.19                             | 40.15                     | —0.04                         |                                  |
| Oct. 11          | $\lambda$ Aquarii       | 81 33 30.83                             | 32.69                     | +1.86                         | } +1.35                          |
|                  | $\psi^1$ Aquarii        | 79 30 12.75                             | 13.70                     | +0.95                         |                                  |
|                  | $\tau$ Piscium          | 83 5 5.74                               | 6.99                      | +1.25                         |                                  |
| Oct. 21          | Fomalhaut               | 59 31 6.54                              | 5.11                      | —1.43                         | } —0.92                          |
| Oct. 22          | $\pi^2$ Capricorni      | 76 57 21.89                             | 21.49                     | —0.40                         |                                  |

| Year and Day.    | Star's Name.       | Apparent Observed South Polar Distance. | Seconds of Tabular S.P.D. | Correction to Observed S.P.D. | Adopted Correction for the Moon. |
|------------------|--------------------|---|---------------------------|-------------------------------|----------------------------------|
| 1837.<br>Nov. 12 | $\alpha^1$ Tauri   | 111° 38' 3" 08                          | 7" 34                     | +4" 26                        | } +4" 17                         |
|                  | $\nu^1$ Tauri      | 112 26 27 32                            | 31 39                     | +4 07                         |                                  |
| Nov. 16          | $\tau$ Geminorum   | 120 30 18 78                            | 18 29                     | -0 49                         | } +1 25                          |
|                  | $\delta$ Geminorum | 112 16 30 36                            | 34 10                     | +3 74                         |                                  |
|                  | $\lambda$ Cancrī   | 114 31 42 12                            | 42 62                     | +0 50                         |                                  |
| Dec. 8           | $\phi$ Piscium     | 98 20 28 40                             | 27 23                     | -1 17                         | } -1 38                          |
|                  | $\gamma^1$ Arietis | 108 29 56 47                            | 54 17                     | -2 30                         |                                  |
|                  | $\pi$ Arietis      | 106 47 19 33                            | 18 20                     | -1 13                         |                                  |
|                  | $\iota$ Arietis    | 110 41 25 27                            | 24 37                     | -0 90                         |                                  |
| Dec. 9           | $\mu$ Tauri        | 113 36 2 21                             | 3 98                      | +1 77                         | } +0 52                          |
|                  | $\alpha^1$ Tauri   | 111 38 8 90                             | 8 17                      | -0 73                         |                                  |
| Dec. 11          | $\tau$ Tauri       | 112 38 30 13                            | 31 72                     | +1 59                         | } -0 07                          |
|                  | $\nu$ Tauri        | 111 21 15 63                            | 14 60                     | -1 03                         |                                  |
|                  | C Tauri            | 117 34 7 78                             | 7 02                      | -0 76                         |                                  |
| Dec. 12          | $\iota$ Aurigæ     | 120 23 27 56                            | 27 36                     | -0 20                         | } +1 14                          |
|                  | $\phi$ Geminorum   | 115 17 9 73                             | 10 50                     | +0 77                         |                                  |
|                  | $\mu^1$ Geminorum  | 114 26 26 00                            | 28 85                     | +2 85                         |                                  |

I have rejected the Cape Observations of 1836, March 8, 26, 30, and 31, because there appears to be some confusion with regard to the part of the micrometer wire made use of (its breadth being nearly 9").

In the Cape calculations of parallax, a compression of  $\frac{1}{8\frac{1}{2}}$ th has been assumed, which I have reduced to  $\frac{1}{8\frac{1}{6}}$ th.

*Greenwich Observations, 1830.*

The numbers have been taken from the Greenwich Lunar Reductions, 1750 to 1830. Professor ADAMS has shown, that PLANA'S parallax, which has been used, with some modifications, in these reductions, requires the

following corrections in order to agree with his tables. (See *Notices* of the Royal Astronomical Society for June 1853, vol. xiii. page 264.)

$$\begin{aligned}
 &''68 - 0.16 \cos x && - 0.13 \cos 2x + 0.03 \cos 3x + 0.04 \cos 4x \\
 &- 0.05 \cos t && + 0.63 \cos 2t + 0.16 \cos 4t \\
 &+ 0.40 \cos (2t - x) && + 0.07 \cos (4t - 2x) \\
 &- 0.28 \cos (2t - x) && - 1.91 \cos (2y - x) + 0.29 \cos (2t + x) \\
 &+ 0.01 \cos (x - t) && - 0.51 \cos (2x - 2t) \\
 &+ 0.09 \cos (2y - 2t) && + 0.14 \cos (t + x) + 0.10 \cos (4t - x) \\
 &- 0.11 \cos (t + x) && - 0.02 \cos (2t + 2x) \\
 &+ 0.12 \cos (2x - z) && - 0.10 \cos (2x + z) + 0.09 \cos (2t - 2z) \\
 &- 0.09 \cos (2y + x - 2t) && + 0.05 \cos (2t - x - 2z) \\
 &+ 0.06 \cos (4t - x - z)
 \end{aligned}$$

The following table, derived from the above formulæ, contains the corrections to PLANA's parallax :—

For Mean Noon.

|               |   |      |             |   |      |
|---------------|---|------|-------------|---|------|
| 1830, April 3 | + | 2.26 | 1830, May 2 | + | 1.82 |
| 4             | + | 2.26 | 3           | + | 1.73 |
| 5             | + | 2.34 | 4           | + | 1.65 |
| 6             | + | 2.23 | 5           | + | 1.47 |
| 7             | + | 1.93 | August 4    | + | 0.39 |
| May 1         | + | 1.86 | 5           | + | 0.48 |

In the Greenwich Lunar Reductions, 1750 to 1830, the semi-diameter which  
 = horizontal equatoreal parallax  $\times 0.273136$ ,  
 has been corrected to agree with Professor HANSEN's value, before mentioned.

*Greenwich Observations, 1832 and 1833.*

Professor HENDERSON's apparent declinations, corrected for refraction, have been used without alteration. Professor AIRY's parallax correction to the Moon's limb has been applied.

*Greenwich Observations, 1834.*

The North Polar Distances of centre at the transit of the Moon's limb have been extracted from the Greenwich Lunar Reductions 1831-51, in which

PLANA's parallax, before mentioned, has been used. The following table gives the correction to be applied to reduce to that of Professor ADAMS :—

For Mean Noon.

| Year and Day.    | Correction<br>to<br>H.E. Parallax. | Year and Day.    | Correction<br>to<br>H.E. Parallax. | Year and Day.    | Correction<br>to<br>H.E. Parallax. |
|------------------|------------------------------------|------------------|------------------------------------|------------------|------------------------------------|
| 1834-<br>June 14 | + 1'8                              | 1834-<br>Aug. 23 | + 1'0                              | 1834-<br>Nov. 16 | + 1'0                              |
| 15               | + 2'0                              | Sept. 11         | — 1'1                              | 17               | + 1'5                              |
| 19               | + 2'3                              | 12               | — 1'6                              | 18               | + 1'8                              |
| 20               | + 2'2                              | 13               | — 2'0                              | 19               | + 2'3                              |
| 21               | + 2'0                              | Oct. 13          | — 2'3                              | 20               | + 2'2                              |
| 22               | + 1'7                              | 14               | — 2'2                              | 21               | + 2'3                              |
| 23               | + 1'1                              | 15               | — 1'9                              | Dec. 8           | — 0'6                              |
| 25               | 0'0                                | 16               | — 1'3                              | 9                | — 0'3                              |
| 26               | — 0'5                              | 17               | — 0'7                              | 10               | — 0'1                              |
| 30               | — 0'1                              | 27               | + 1'3                              | 11               | + 0'3                              |
| July 1           | + 0'3                              | 28               | + 1'2                              | 12               | + 0'8                              |
| 13               | + 1'6                              | Nov. 6           | — 0'9                              | 13               | + 1'4                              |
| 14               | + 1'3                              | 7                | — 1'2                              | 14               | + 2'1                              |
| 15               | + 1'0                              | 10               | — 1'7                              | 15               | + 2'7                              |
| 16               | + 0'8                              | 11               | — 1'7                              | 16               | + 3'0                              |
| 19               | + 1'7                              | 12               | — 1'5                              | 17               | + 3'0                              |
| 20               | + 2'3                              | 13               | — 1'1                              | 18               | + 2'8                              |
| 21               | + 2'5                              | 14               | — 0'4                              |                  |                                    |
| Aug. 22          | + 1'3                              | 15               | + 0'3                              |                  |                                    |

The correction for motion during the passage of the Moon's semi-diameter, derived from the following formulæ, has been applied to the North Polar Distance of centre at the transit of limb. Calling  $c$  and  $c'$  the motions in right ascension and declination (respectively), in 10 minutes of mean solar time,  $d$  the Moon's geocentric semi-diameter, and  $\delta$  the Moon's declination, the motion in declination

$$= \frac{c'}{9025} d \sec \delta + \frac{c'c}{(9025)^2} d \sec \delta + \frac{c'c^2}{(9025)^3} d \sec \delta.$$

(HANSEN's Tables of the Moon, page 65.)

The semi-diameter in the Greenwich Lunar Reductions 1831-51, has been computed

$$= \text{Moon's horizontal equatoreal parallax} \times 0.273136,$$

and a proper correction has been applied to reduce it to that of Professor HANSEN.

*Greenwich Observations, 1836 and 1837.*

The columns of the table require no explanation. I have applied the corrections of parallax and semi-diameter to the numbers of the Greenwich Observations of 1836 and 1837, in which the *Nautical Almanac* elements have been used without alteration.

*Cambridge Observations, 1834.*

The numbers have been extracted from the printed volume, with the following corrections :— 1st. That arising from the erroneous reading of the barometer given in the Appendix to the volume ; 2d. The mean difference of the Greenwich Catalogue of 1439 stars, and the first Cambridge Catalogue, amounting to  $+ 0''.64$ .

A compression of  $\frac{1}{8}$ th has been used in the Cambridge computations of parallax, which I have reduced to  $\frac{1}{16}$ th.

*Cambridge Observations, 1836 and 1837.*

The printed results have been increased by  $+ 1''.39$  and  $+ 1''.20$  respectively, in addition to the usual corrections, in order to satisfy the Greenwich Observations of 1836 and 1837.

The latter numbers have been deduced from a comparison of the places of the principal stars observed, with the Greenwich Catalogues of these years.

In the Cambridge Observations the *Nautical Almanac* elements have been used without alteration, except that in the year 1837 Professor CHALLIS has increased the semi-diameter by  $2''.89$ , which I have allowed for in the following section.

*Edinburgh Observations, 1834, 1836, and 1837.*

The columns of the tables require no explanation. The Moon's parallax in zenith distance has been corrected for the error in Section I., and its semi-diameter has been reduced to that of Professor HANSEN. IVORY's refractions, which have been made use of in the Edinburgh Observations, have been reduced to those of BESSEL, and in the few cases of zenith distances exceeding  $80^\circ$ , Mr. MAIN's further corrections have been applied. Professor HENDERSON, in his reductions of 1837, has increased the Moon's parallax by  $\frac{1}{2880}$ th part, which has been properly allowed for in the reductions to Professor ADAMS' corrections. The semi-diameter of this year has also been increased by  $\frac{1}{540}$ th part.

SECTION III.—*Equations of Condition.*

The method pursued in the formation of the equations of condition is the same as that given by Professor HENDERSON in his memoir, the only difference being that I have adopted (without variation) a compression of  $\frac{1}{310}$ , and have assumed Professor HANSEN's semi-diameter to be so nearly correct, that the residual error will be exceedingly small. The investigation is as follows :—

Let  $\delta A$ ,  $\delta A'$ , and  $\delta A''$  be the observed motions of the Moon in north polar distance, in the times elapsed between the transit of her centre over the meridians of the Cape, Greenwich, Cambridge, and Edinburgh, respectively. Let  $A$ ,  $A'$ ,  $A''$ , be the true motions of the Moon in north polar distance, in the same time computed from the tables. Then the following equations result.

Let  $K$  = assumed constant of horizontal equatoreal parallax,  $K + \delta K$  = the true.

Then

$$p + \frac{p}{K} \delta K = \text{true parallax in North Polar Distance at Greenwich Transit.}$$

$$p' + \frac{p'}{K} \delta K, \quad p'' + \frac{p''}{K} \delta K, \quad p''' + \frac{p'''}{K} \delta K;$$

similar quantities for Cambridge, Edinburgh, and the Cape, respectively.

And

$$A + f \delta t = \delta A + \frac{p - p'''}{K} \delta K.$$

$$A' + f' \delta t = \delta A' + \frac{p' - p'''}{K} \delta K.$$

$$A'' + f'' \delta t = \delta A'' + \frac{p'' - p'''}{K} \delta K.$$

$$f = \frac{A}{\text{Diff. of Longitude}} \text{ etc.}$$

or,

$$a + b \delta K = 0.$$

$$a' + b' \delta K = 0.$$

$$a'' + b'' \delta K = 0.$$

where

$$a = (A + f \delta t) - \delta A.$$

$$b = \frac{(p''' - p)}{K}, \text{ etc.}$$

$\delta t$  is the correction of the assumed longitude of the Cape in seconds of time.

The true motions in North Polar Distance for 1830 have been interpolated, with fourth differences, from the *Berlin Jahrbuch*; for 1832 and 1833, they have been taken, without alteration (except a small change between Cambridge and the Cape), from the memoir by Professor HENDERSON.

For 1834, the Greenwich tabular North Polar Distance at transit has been interpolated from the *Nautical Almanac*, and the true motion in north polar distance has been obtained by comparison with the tabular place of the Cape Observations; in the other instances of this year, the interpolated places given in the Cambridge and Edinburgh Observations have been used. For 1836 and 1837, the Cape mean solar time of transit of the Moon's centre has been computed from the data of the *Nautical Almanac*, and the Moon's tabular north polar distance obtained. The other tabular places of these years, for comparison with the tabular places of the Cape, have been taken from the published observations. An additional correction has been applied to the interpolated places of the Cambridge Observations, in order to satisfy the more recent determination of the longitude of that observatory by galvanic signals.

#### *Solution of the Equations of Condition.*

In the solution of the equations, when the mean result of Greenwich and Cambridge is taken, the weight adopted is  $\frac{2}{\sqrt{3}}$ , or 1.15.

When Greenwich, Cambridge, and Edinburgh, are used, the weight adopted is 1.50.

Then the resulting single equation, deduced by the method of *minimum squares* is,

$$-95''.60 + 254.279 \delta K + 3.382 \delta t = 0$$

or,

$$\delta K = +0''.376 - 0.013 \delta t.$$

Applying the latter correction to Professor ADAMS' constant, the resulting value from these observations is  $3422''.32 + 0''.38 = 57' 2''.70$ . From the accuracy of the methods employed in the calculations, this determination is likely to be entitled to considerable confidence.

HUGH BREEN.

*Lewisham, July 18th, 1863.*

#### SECTION IV.—Observations.

##### FALLOWS' Cape Observations.

| Day.             | Limb Observed. | N.P.D. of Centre at Passage of Centre. | Parallax.  |             | Semidiameter. |             | Corrected Seconds of N.P.D. |
|------------------|----------------|--|------------|-------------|---------------|-------------|-----------------------------|
|                  |                |  |            | Correction. |               | Correction. |                             |
| 1830.<br>April 3 | N              | 78° 43' 13".46                         | 39' 21".54 | +2".05      | 14' 56".38    | +2".25      | 17".76                      |
| 4                | N              | 82 4 29.07                             | 36 46.43   | +1.76       | 14 50.17      | +2.17       | 33.00                       |
| 5                | N              | 85 44 9.71                             | 33 55.63   | +1.55       | 14 45.57      | +2.12       | 13.38                       |
| 6                | N              | 89 33 2.15                             | 30 54.71   | +1.43       | 14 42.80      | +2.12       | 5.70                        |
| May 1            | N              | 80 48 17.58                            | 37 53.85   | +2.58       | 14 55.60      | +2.49       | 22.65                       |
| 3                | N              | 88 12 30.92                            | 32 1.12    | +1.55       | 14 44.59      | +2.16       | 34.63                       |
| 4                | N              | 92 3 48.54                             | 28 54.47   | +1.39       | 14 42.49      | +2.15       | 52.08                       |
| Aug. 4           | N              | 103 40 38.11                           | 20 40.31   | −0.26       | 15 57.63      | +1.35       | 39.20                       |
| 5                | N              | 100 4 23.31                            | 24 20.43   | −0.54       | 16 5.97       | +1.22       | 23.99                       |



## FALLOWS' Cape Observations.

## At Transit of Limb.

| Year and Day.    | N.P.D. of Centre<br>at<br>Transit of Centre. | Correction<br>for<br>Motion. | N.P.D. of Centre<br>at<br>Transit of Limb. |
|------------------|--|------------------------------|--|
| 1830.<br>April 3 | 78° 43' 17.76                                | — 8.15                       | 78° 43' 9.61                               |
| 4                | 82 4 33.00                                   | 8.90                         | 82 4 24.10                                 |
| 5                | 85 44 13.38                                  | 9.31                         | 85 44 4.07                                 |
| 6                | 89 33 5.70                                   | 9.44                         | 89 32 56.26                                |
| May 1            | 80 48 22.65                                  | 8.82                         | 80 48 13.83                                |
| 3                | 88 12 34.63                                  | 9.50                         | 88 12 25.13                                |
| 4                | 92 3 52.08                                   | 9.45                         | 92 3 42.63                                 |
| Aug. 4           | 103 40 39.20                                 | 9.00                         | 103 40 30.20                               |
| 5                | 100 4 23.99                                  | —10.99                       | 100 4 13.00                                |

## Cape Observations.

| Day.            | Apparent<br>N.P.D. at<br>Transit of<br>Centre. | Limb<br>Observed. | Parallax. |                  | Semidia-<br>meter<br>(Hansen). | Geocentric<br>N.P.D. of Centre<br>at Transit of<br>Centre. | Small<br>Correc-<br>tion for<br>Parallax. | Seconds<br>Correct-<br>ed. |
|-----------------|--|-------------------|-----------|------------------|--------------------------------|--|---|----------------------------|
|                 |  |                   |           | Correc-<br>tion. |                                |  |   |                            |
| 1832.<br>May 18 | 110° 19' 53.2                                  | N                 | 12' 32.70 | +0.42            | 14' 46.23                      | 110° 47' 12.55   | +0.07                                     | 12.62                      |
| 19              | 109 22 15.5                                    | N                 | 13 26.30  | +0.52            | 14 47.30                       | 109 50 29.62   | +0.07                                     | 29.69                      |
| June 10         | 103 6 41.1                                     | N                 | 19 22.90  | +0.43            | 15 0.80                        | 103 41 5.23  | +0.08                                     | 5.31                       |
| July 8          | 105 18 16.6                                    | N                 | 17 17.70  | +0.39            | 14 56.21                       | 105 50 30.90   | +0.08                                     | 30.98                      |
| 20              | 81 56 46.4                                     | N                 | 38 16.00  | +1.62            | 15 41.76                       | 82 50 45.78  | +0.12                                     | 45.90                      |
| Aug. 10         | 108 11 33.9                                    | S                 | 14 30.90  | +0.89            | 14 47.74                       | 108 11 17.95   | 0.00                                      | 17.95                      |
| 11              | 105 27 36.1                                    | S                 | 17 3.40   | +0.99            | 14 51.61                       | 105 29 48.78   | —0.01                                     | 48.77                      |
| Sept. 30        | 110 9 5.1                                      | N                 | 12 46.20  | +0.54            | 14 50.44                       | 110 36 42.28   | +0.07                                     | 42.35                      |
| Oct. 12         | 72 57 4.2                                      | N                 | 45 13.10  | —1.75            | 15 55.84                       | 73 58 11.39  | +0.13                                     | 11.52                      |

## Cape Observations (continued).

| Day.                       | Apparent<br>N.P.D. at<br>Transit of<br>Centre. | Limb<br>Observed. | Parallax.  |                  | Semidia-<br>meter<br>(Hansen). | Geocentric<br>N.P.D. of Centre<br>at Transit of<br>Centre. | Small<br>Correc-<br>tion for<br>Parallax. | Seconds<br>Correct-<br>ed. |
|----------------------------|--|-------------------|------------|------------------|--------------------------------|--|---|----------------------------|
|                            |  |                   |            | Correc-<br>tion. |                                |  |   |                            |
| <sup>1832.</sup><br>Nov. 2 | 102° 56' 20".5                                 | S                 | 19' 27".60 | +1".06           | 14' 58".58                     | 103° 0' 50".58   | -0".01                                    | 50".57                     |
| 6                          | 84 16 26.7                                     | S                 | 36 22.90   | +0.28            | 15 42.45                       | 84 37 7.43   | -0.05                                     | 7.38                       |
| 16                         | 82 43 42.7                                     | S                 | 38 12.10   | +1.40            | 15 54.64                       | 83 6 1.56  | -0.05                                     | 1.51                       |
| Dec. 15                    | 91 21 41.0                                     | S                 | 30 41.60   | +1.05            | 15 39.77                       | 91 36 43.88  | -0.04                                     | 43.84                      |
| <sup>1833.</sup><br>Jan. 6 | 68 17 22.8                                     | S                 | 50 24.00   | +1.03            | 16 43.36                       | 68 51 4.47   | -0.07                                     | 4.40                       |
| 28                         | 81 27 50.4                                     | S                 | 37 57.50   | -0.52            | 15 24.50                       | 81 50 22.88  | -0.05                                     | 22.83                      |
| 30                         | 73 1 16.9                                      | S                 | 45 7.70    | -1.75            | 15 54.96                       | 73 30 27.89  | -0.06                                     | 27.83                      |
| Feb. 2                     | 67 9 34.1                                      | S                 | 50 50.30   | -0.62            | 16 38.11                       | 67 43 45.67  | -0.07                                     | 45.60                      |
| 3                          | 68 33 23.2                                     | N                 | 50 20.80   | +0.47            | 16 45.28                       | 69 40 29.75  | +0.14                                     | 29.89                      |
| 28                         | 68 32 52.8                                     | S                 | 48 17.20   | -2.54            | 16 3.12                        | 69 5 4.34  | -0.07                                     | 4.27                       |
| Mar. 4                     | 73 24 53.7                                     | N                 | 47 0.70    | -0.59            | 16 40.91                       | 74 28 34.72  | +0.13                                     | 34.85                      |
| 5                          | 78 13 24.4                                     | N                 | 43 29.70   | +0.43            | 16 39.28                       | 79 13 33.81  | +0.13                                     | 33.94                      |
| 6                          | 83 43 53.1                                     | N                 | 38 55.00   | +1.16            | 16 32.59                       | 84 39 21.85  | +0.12                                     | 21.97                      |
| 28                         | 66 57 34.8                                     | N                 | 48 57.90   | -1.05            | 15 59.02                       | 68 2 30.67   | +0.14                                     | 30.81                      |
| 31                         | 71 28 39.8                                     | N                 | 47 32.30   | -2.52            | 16 24.32                       | 72 32 33.90  | +0.14                                     | 34.04                      |
| April 1                    | 75 43 17.4                                     | N                 | 44 50.80   | -2.01            | 16 28.06                       | 76 44 34.25  | +0.13                                     | 34.38                      |
| 3                          | 86 32 17.4                                     | N                 | 36 17.60   | -0.13            | 16 23.63                       | 87 24 58.50  | +0.11                                     | 58.61                      |
| 5                          | 98 18 47.2                                     | S                 | 25 14.50   | +0.82            | 16 3.69                        | 98 27 58.83  | -0.02                                     | 58.81                      |
| 26                         | 67 35 50.7                                     | N                 | 48 59.70   | +0.60            | 16 7.27                        | 68 40 58.27  | +0.14                                     | 58.41                      |
| 28                         | 73 52 53.7                                     | N                 | 45 26.30   | -0.68            | 16 13.84                       | 74 54 33.16  | +0.13                                     | 33.29                      |
| 29                         | 78 37 58.7                                     | N                 | 42 9.10    | -1.09            | 16 14.76                       | 79 36 21.47  | +0.13                                     | 21.60                      |
| 30                         | 84 1 20.9                                      | N                 | 37 57.90   | -0.87            | 16 13.31                       | 84 55 31.24  | +0.12                                     | 31.36                      |
| May 3                      | 100 28 37.3                                    | N                 | 22 58.60   | +0.53            | 15 53.52                       | 101 7 29.95  | +0.09                                     | 30.04                      |
| 4                          | 104 56 41.9                                    | N                 | 18 32.00   | +0.75            | 15 42.87                       | 105 30 57.52   | +0.08                                     | 57.60                      |
| 11                         | 105 21 54.8                                    | N                 | 17 5.40    | +0.71            | 14 48.67                       | 105 53 49.58   | +0.08                                     | 49.66                      |

## Cape Observations.

Colatitude  $56^{\circ} 3' 56''.75$ .

| Day.                     | Limb Observed. | App. Z.D. Corrected for Refraction, and (R-D) Correction. | Parallax.* |             | Semidiameter (Hansen). | Correction to Cape S.P.D. | Geocentric S.P.D. of Centre. |
|--------------------------|----------------|---|------------|-------------|------------------------|---------------------------|------------------------------|
|                          |                |   | +0''07.    | Correction. |                        |                           |                              |
| <sup>1834.</sup> June 19 | N              | 14° 8' 56''97   | 14' 11''89 | +0''31      | 16' 4''35              | -1''60                    | 69° 42' 35''57               |
| 20                       | N              | 11 21 3'05  | 11 17'99   | +0''29      | 15 55'86               | -0''41                    | 66 57 45'25                  |
| 22                       | N              | 10 26 50'55   | 10 9'38    | +0''18      | 15 34'14               | -0''09                    | 66 5 3'51                    |
| 30                       | N              | 43 15 7'92  | 37 13'69   | +0''63      | 14 53'84               | -1'33                     | 98 26 55'18                  |
| July 14                  | N              | 25 15 21'99   | 24 59'57   | +1'20       | 16 7'36                | +0'57                     | 80 38 11'18                  |
| 15                       | N              | 19 54 51'37   | 19 49'21   | +0'86       | 16 2'82                | +0'39                     | 75 22 55'62                  |
| Aug. 22                  | N              | 34 32 29'37   | 30 30'40   | +0'31       | 14 46'27               | +0'49                     | 89 51 9'63                   |
| Sept. 11                 | S              | 9 18 3'51   | 9 1'71     | +0'02       | 15 33'42               | -1'41                     | 65 28 30'54                  |
| 12                       | S              | 9 37 27'30  | 9 14'00    | +0'10       | 15 22'41               | -0'56                     | 65 47 31'80                  |
| Oct. 13                  | S              | 20 47 47'85   | 19 10'94   | -0'03       | 14 52'96               | ..                        | 76 47 (26'65)                |
| 15                       | S              | 30 38 23'70   | 27 21'70   | +0'58       | 14 45'08               | ..                        | 86 29 (43'25)                |
| 16                       | S              | 35 49 24'34   | 31 23'97   | +0'88       | 14 43'71               | +1'32                     | 91 36 41'27                  |
| Nov. 10                  | S              | 23 48 2'02  | 21 48'67   | -0'22       | 14 52'16               | ..                        | 79 45 (2'48)                 |
| 12                       | S              | 34 0 13'29  | 30 2'58    | +0'11       | 14 44'80               | +1'19                     | 89 48 53'34                  |
| 15                       | S              | 48 51 33'80   | 40 42'37   | +1'12       | 14 48'98               | +1'61                     | 104 29 37'65                 |
| Dec. 10                  | S              | 37 14 36'50   | 32 34'87   | +0'20       | 14 46'28               | +1'37                     | 93 0 45'83                   |
| 11                       | S              | 42 20 37'38   | 36 18'17   | +0'40       | 14 46'77               | +0'34                     | 98 3 2'67                    |
| 13                       | S              | 51 30 28'45   | 42 33'81   | +1'45       | 14 54'28               | +1'14                     | 107 6 45'36                  |
| <sup>1836.</sup> Jan. 3  | N              | 61 25 58'38   | 47 39'83   | +2'51       | 14 52'00               | -0'81                     | 116 27 19'98                 |
| 7                        | S              | 49 33 41'52   | 42 32'67   | +0'69       | 15 19'11               | -1'78                     | 105 10 22'24                 |
| Feb. 26                  | N              | 61 33 58'95   | 47 40'72   | +1'37       | 14 50'71               | +0'86                     | 116 35 23'76                 |
| 29                       | N              | 57 26 57'84   | 46 48'75   | +1'58       | 15 12'75               | -2'34                     | 112 28 49'17                 |
| March 6                  | S              | 22 58 33'16   | 22 46'04   | +1'32       | 16 4'12                | +0'62                     | 78 55 47'29                  |
| 8                        | S              | 12 19 22'08   | 12 26'15   | +0'48       | 16 9'59                | -1'40                     | 68 27 0'39                   |
| 26                       | N              | 61 9 6'40   | 47 50'61   | +0'19       | 14 57'07               | -1'24                     | 116 10 14'04                 |
| 30                       | N              | 45 28 1'20  | 40 49'81   | +0'48       | 15 41'97               | -0'78                     | 100 35 24'91                 |

\* A correction of +0''07 has been applied to reduce the Parallax to a compression of  $\frac{1}{305}$ .

1834, Oct. 13, 15, and Nov. 10. In consequence of the uncertainty of the index error, these observations have not been incorporated with the rest.

*Moon's Horizontal Equatoreal Parallax.*

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*Cape Observations (continued).*

| Day.     | Limb Observed. | Apparent Z.D.<br>Corrected for<br>Refraction. | Parallax.  |             | Semidiameter<br>(Hansen). | Correction<br>to Cape<br>S.P.D. | Geocentric S.P.D.<br>of Centre. |
|----------|----------------|---|------------|-------------|---------------------------|---------------------------------|---------------------------------|
|          |                |   | + 0".07.   | Correction. |                           |                                 |                                 |
| 1836.    |                |   |            |             |                           |                                 |                                 |
| Mar. 31  | N              | 39° 15' 12".34                                | 36' 40".30 | + 1".16     | 15' 54".49                | + 2".50                         | 94° 26' 35".64                  |
| April 24 | N              | 57 18 24.03                                   | 46 22.14   | — 0.69      | 15 4.83                   | — 3.00                          | 112 20 51.50                    |
| 25       | N              | 53 16 43.18                                   | 44 43.46   | — 1.36      | 15 16.39                  | — 1.16                          | 108 20 40.28                    |
| 26       | N              | 48 14 54.60                                   | 42 13.89   | — 1.57      | 15 29.99                  | — 0.65                          | 103 21 8.39                     |
| 27       | N              | 42 24 21.11                                   | 38 45.67   | — 1.19      | 15 45.01                  | + 0.52                          | 97 33 48.89                     |
| 28       | N              | 35 58 45.14                                   | 34 16.13   | — 0.61      | 16 0.10                   | + 1.19                          | 91 12 27.46                     |
| 29       | N              | 29 15 57.74                                   | 28 52.69   | + 0.16      | 16 13.87                  | + 0.50                          | 84 34 48.27                     |
| May 2    | S              | 11 7 30.95                                    | 11 30.47   | + 0.74      | 16 34.44                  | + 0.95                          | 67 16 31.88                     |
| June 24  | N              | 22 30 0.20                                    | 22 28.82   | + 0.16      | 16 10.25                  | + 0.39                          | 77 55 18.11                     |
| 26       | N              | 11 46 52.60                                   | 12 13.25   | + 0.26      | 16 36.40                  | — 1.40                          | 67 21 58.04                     |
| 29       | N              | 8 19 19.15                                    | 8 38.61    | + 0.39      | 16 40.90                  | — 0.63                          | 63 57 55.37                     |
| July 23  | N              | 13 37 7.70                                    | 13 50.45   | + 0.64      | 16 16.86                  | + 0.64                          | 69 10 57.14                     |
| 26       | S              | 6 54 11.93                                    | 7 7.87     | + 0.52      | 16 39.52                  | — 0.06                          | 63 7 39.75                      |
| Aug. 22  | S              | 6 29 5.97                                     | 6 35.63    | + 0.62      | 16 24.66                  | — 1.70                          | 62 42 49.43                     |
| Sept. 20 | S              | 9 17 22.64                                    | 9 23.64    | + 0.95      | 16 14.03                  | + 1.50                          | 65 28 10.33                     |
| 23       | S              | 25 3 24.34                                    | 24 37.18   | + 2.91      | 16 0.90                   | + 3.61                          | 80 58 45.51                     |
| Oct. 18  | S              | 11 49 0.07                                    | 11 51.33   | + 0.77      | 16 4.56                   | + 1.46                          | 67 57 10.74                     |
| 19       | S              | 16 45 37.59                                   | 16 40.89   | + 1.33      | 15 59.40                  | + 0.52                          | 72 48 52.04                     |
| 20       | S              | 22 36 29.74                                   | 22 9.25    | + 1.98      | 15 53.24                  | + 2.71                          | 78 34 11.21                     |
| 21       | S              | 28 57 29.35                                   | 27 44.58   | + 2.89      | 15 46.32                  | + 1.82                          | 84 49 26.77                     |
| 22       | S              | 35 27 7.80                                    | 32 59.49   | + 3.49      | 15 38.17                  | + 2.26                          | 91 13 42.00                     |
| 23       | S              | 41 46 28.72                                   | 37 33.93   | + 3.82      | 15 29.23                  | + 3.25                          | 97 28 20.20                     |
| 24       | N              | 48 9 21.37                                    | 41 38.71   | + 3.79      | 15 20.38                  | + 2.09                          | 103 16 17.33                    |
| Nov. 19  | S              | 39 35 31.20                                   | 35 48.92   | + 2.44      | 15 25.80                  | + 3.07                          | 95 19 5.46                      |
| Dec. 15  | S              | 31 28 18.26                                   | 29 48.07   | + 1.53      | 15 41.67                  | + 1.52                          | 87 18 8.60                      |
| 19       | S              | 54 6 13.90                                    | 44 24.61   | + 1.85      | 15 1.39                   | + 1.62                          | 109 40 47.20                    |
| 23       | N              | 62 20 2.62                                    | 47 41.01   | + 0.81      | 14 44.16                  | + 1.63                          | 117 21 35.02                    |
| 1837.    |                |   |            |             |                           |                                 |                                 |
| Feb. 14  | N              | 61 57 43.22                                   | 47 52.59   | + 1.14      | 14 51.04                  | — 0.20                          | 116 58 55.00                    |
| 15       | N              | 62 44 28.13                                   | 45 59.27   | + 0.64      | 14 46.50                  | — 1.20                          | 117 47 37.27                    |
| 16       | N              | 62 8 14.85                                    | 47 37.10   | + 0.18      | 14 44.49                  | + 0.08                          | 117 9 49.91                     |

1836, Oct. 23. It has been assumed that the mean of microscopes was 10" in error.

*Cape Observations (concluded).*

| Day.     | Limb Observed. | Apparent Z.D.<br>Corrected for<br>Refraction. | Parallax.  |             | Semidiameter<br>(Hansen). | Correction<br>to Cape<br>S.P.D. | Geocentric S.P.D.<br>of Centre. |
|----------|----------------|---|------------|-------------|---------------------------|---------------------------------|---------------------------------|
|          |                |   | + 0".07.   | Correction. |                           |                                 |                                 |
| 1837.    |                |   |            |             |                           |                                 |                                 |
| Feb. 21  | S              | 41° 55' 0".67                                 | 36' 35".33 | + 2".13     | 15' 1".65                 | + 0".15                         | 97° 37' 21".76                  |
| 22       | S              | 35 58 0.59                                    | 32 23.49   | + 1.39      | 15 8.66                   | 0.00                            | 91 44 41.12                     |
| Mar. 18  | N              | 54 40 42.16                                   | 44 14.16   | + 0.28      | 14 50.83                  | - 1.18                          | 109 45 32.46                    |
| 19       | N              | 49 57 16.31                                   | 41 43.50   | + 0.88      | 14 56.13                  | - 2.46                          | 105 4 30.09                     |
| 20       | N              | 44 31 41.74                                   | 38 28.86   | + 1.58      | 15 3.02                   | - 0.20                          | 99 42 4.83                      |
| April 14 | N              | 56 25 27.77                                   | 45 7.28    | - 0.38      | 14 49.51                  | + 1.50                          | 111 29 29.61                    |
| 20       | S              | 21 55 48.12                                   | 21 13.63   | + 1.72      | 15 40.22                  | + 1.41                          | 77 54 11.15                     |
| May 25   | N              | 16 22 27.49                                   | 16 30.95   | + 1.41      | 16 12.06                  | - 0.63                          | 71 53 39.19                     |
| June 14  | N              | 21 55 20.24                                   | 21 14.64   | + 0.50      | 15 40.43                  | + 1.65                          | 77 22 23.07                     |
| 17       | S              | 7 24 7.85                                     | 7 31.67    | + 0.47      | 16 22.29                  | - 0.12                          | 63 36 54.63                     |
| 24       | N              | 33 42 40.26                                   | 32 12.17   | + 1.71      | 15 56.50                  | - 0.73                          | 88 58 25.90                     |
| July 11  | N              | 24 17 35.22                                   | 23 0.01    | + 1.12      | 15 23.60                  | + 0.02                          | 79 43 7.26                      |
| 13       | N              | 13 26 5.56                                    | 13 20.55   | + 0.75      | 15 54.66                  | - 0.28                          | 69 0 46.07                      |
| 14       | N              | 9 21 9.09                                     | 9 26.21    | + 0.55      | 16 10.43                  | - 2.23                          | 64 59 26.42                     |
| 15       | N              | 6 51 26.19                                    | 6 59.08    | + 0.45      | 16 25.33                  | + 1.57                          | 62 31 59.65                     |
| 16       | S              | 5 52 22.24                                    | 6 1.58     | + 0.41      | 16 36.55                  | - 0.38                          | 62 6 53.17                      |
| Aug. 10  | N              | 10 44 19.97                                   | 10 36.44   | + 0.99      | 15 50.20                  | + 1.04                          | 66 21 50.13                     |
| 11       | N              | 7 35 28.49                                    | 7 35.51    | + 0.72      | 16 5.99                   | - 1.04                          | 63 15 41.98                     |
| 12       | S              | 5 39 14.81                                    | 5 42.21    | + 0.55      | 16 21.17                  | - 0.27                          | 61 53 49.70                     |
| 13       | S              | 6 24 7.08                                     | 6 33.82    | + 0.61      | 16 33.32                  | - 0.44                          | 62 38 2.28                      |
| Sept. 10 | S              | 7 34 24.90                                    | 7 43.17    | + 0.91      | 16 24.96                  | + 0.29                          | 63 47 2.82                      |
| Oct. 9   | S              | 14 26 55.39                                   | 14 44.24   | + 1.61      | 16 21.88                  | - 0.07                          | 70 32 28.10                     |
| 11       | S              | 27 28 36.32                                   | 27 33.58   | + 2.63      | 16 26.61                  | + 1.35                          | 83 21 24.82                     |
| 21       | S              | 57 46 49.37                                   | 45 47.31   | - 0.22      | 14 48.95                  | - 0.92                          | 113 19 47.06                    |
| Nov. 12  | N              | 57 11 42.01                                   | 48 17.20   | + 1.93      | 15 44.25                  | + 4.17                          | 112 11 39.55                    |
| 16       | S              | 61 37 42.55                                   | 48 17.75   | - 0.58      | 15 1.21                   | + 1.25                          | 117 8 24.59                     |
| Dec. 8   | S              | 49 27 49.25                                   | 43 47.33   | + 1.35      | 15 47.62                  | - 1.38                          | 105 3 43.56                     |
| 9        | S              | 54 47 33.65                                   | 46 43.01   | + 1.61      | 15 39.91                  | + 0.52                          | 110 20 26.21                    |
| 11       | N              | 62 9 43.86                                    | 49 40.15   | + 1.48      | 15 22.76                  | - 0.07                          | 117 8 36.15                     |
| 12       | N              | 63 14 32.48                                   | 49 40.65   | + 1.13      | 15 13.79                  | + 1.14                          | 118 13 34.80                    |

*Greenwich Observations, 1830.*Adopted Colatitude  $38^{\circ} 31' 21'' \cdot 93$ .

| G.M.S.T. of Transit<br>of Limb. |   |              |              | Limb<br>Observed. | Apparent Z.D.<br>Corrected for<br>Refraction. | Parallax.     |                  | Semidiameter<br>(Hansen). | N.P.D. of Centre<br>at Transit of<br>Limb. | Corrected<br>for Motion<br>Applied. |              |               |        |
|---------------------------------|---|--------------|--------------|-------------------|---|---------------|------------------|---------------------------|--|-------------------------------------|--------------|---------------|--------|
|                                 |   |              |              |                   |   |               | Cor-<br>rection. |                           |  |                                     |              |               |        |
| 1830.                           |   | <sup>h</sup> | <sup>m</sup> | <sup>s</sup>      |   | <sup>°</sup>  | <sup>'</sup>     | <sup>″</sup>              |  | <sup>°</sup>                        | <sup>'</sup> | <sup>″</sup>  |        |
| April                           | 3 | 8            | 59           | 6.3               | N   | 40° 42' 20.41 | 35'              | 32.28                     | +1.47                                      | +14'                                | 58.28        | 78° 52' 58.72 | — 8.15 |
|                                 | 4 | 9            | 43           | 41.1              | N   | 44 7 1.62     | 37               | 40.87                     | +1.59                                      | 14                                  | 51.94        | 82 15 24.13   | — 8.90 |
|                                 | 5 | 10           | 26           | 57.6              | N   | 47 49 41.15   | 39               | 56.17                     | +1.70                                      | 14                                  | 47.54        | 85 55 43.44   | — 9.31 |
|                                 | 6 | 11           | 9            | 27.7              | N   | 51 40 58.65   | 42               | 10.06                     | +1.64                                      | 14                                  | 44.84        | 89 44 44.28   | — 9.44 |
| May                             | 1 | 7            | 41           | 56.2              | N   | 42 49 49.81   | 37               | 2.07                      | +1.23                                      | 14                                  | 57.64        | 80 58 57.26   | — 8.82 |
|                                 | 3 | 9            | 8            | 14.4              | N   | 50 19 50.99   | 41               | 27.02                     | +1.31                                      | 14                                  | 46.57        | 88 24 21.66   | — 9.50 |
|                                 | 4 | 9            | 50           | 24.0              | N   | 54 13 14.58   | 43               | 36.18                     | +1.29                                      | 14                                  | 44.54        | 92 15 34.13   | — 9.45 |
| Aug.                            | 4 | 12           | 28           | 47.1              | N   | 65 56 38.15   | 53               | 9.61                      | +0.40                                      | 15                                  | 59.42        | 103 30 40.49  | + 9.00 |
|                                 | 5 | 13           | 22           | 24.1              | N   | 61 56 34.62   | 51               | 55.94                     | +0.44                                      | +16                                 | 7.55         | 99 51 56.73   | +10.99 |

*Greenwich Observations, 1832 and 1833.*

| Day.     | Limb. | Apparent N.P.D. at Transit of Centre. | Parallax.  |                  | Semidiameter. |                  | Geocentric North Polar Distance of Centre. | Small Correction for Parallax. |
|----------|-------|---------------------------------------|------------|------------------|---------------|------------------|--|--------------------------------|
|          |       |                                       |            | Correc-<br>tion. |               | Correc-<br>tion. |  |                                |
| 1832.    |       |                                       |            |                  |               |                  |  |                                |
| May 18   | N     | 111° 22' 30".6                        | 51' 31".60 | +1".72           | 14' 44".30    | +1".93           | 110° 45' 43".51                            | +0".09                         |
| 19       | N     | 110 22 40.4                           | 51 18.10   | +1.96            | 14 45.40      | +2.01            | 109 46 7.75                                | +0.09                          |
| June 10  | N     | 104 26 47.8                           | 50 0.50    | +1.10            | 14 58.60      | +1.80            | 103 51 46.60                               | +0.08                          |
| July 8   | N     | 106 35 25.0                           | 50 33.10   | +1.16            | 14 54.00      | +1.91            | 105 59 46.65                               | +0.08                          |
| 20       | N     | 83 0 55.0                             | 40 5.10    | +1.72            | 15 40.20      | +2.26            | 82 36 30.74                                | +0.06                          |
| Aug. 10  | S     | 109 10 0.5                            | 50 56.00   | +3.11            | 14 45.50      | +2.34            | 108 4 13.55                                | -0.16                          |
| 11       | S     | 106 25 21.9                           | 50 14.20   | +2.92            | 14 49.50      | +2.31            | 105 20 12.97                               | -0.15                          |
| Sept. 30 | N     | 111 16 32.1                           | 51 43.40   | +2.11            | 14 48.20      | +2.04            | 110 39 36.83                               | +0.09                          |
| Oct. 12  | N     | 74 5 9.3                              | 33 45.40   | -1.31            | 15 55.30      | +0.94            | 73 47 21.45                                | +0.04                          |

*Greenwich Observations, 1832 and 1833 (continued).*

| Day.    | Limb. | Apparent<br>N.P.D.<br>at Transit<br>of Centre. | Parallax.   |                  | Semidiameter. |                  | Geocentric<br>North Polar<br>Distance<br>at Transit of<br>Centre. | Small<br>Correc-<br>tion for<br>Parallax. |
|---------|-------|--|-------------|------------------|---------------|------------------|---|---|
|         |       |  |             | Correc-<br>tion. |               | Correc-<br>tion. |   |   |
| 1832.   |       |  |             |                  |               |                  |   |   |
| Nov. 2  | S     | 103° 54' 39"                                   | 49° 40' 70" | +2' 70"          | 14' 56' 60"   | +2' 28"          | 102° 49' 21' 62"  | -0' 15"                                   |
| 6       | S     | 85 19 29' 1"                                   | 41 45' 70"  | +0' 32"          | 15 41' 50"    | +1' 67"          | 84 21 59' 91"   | -0' 12"                                   |
| 16      | S     | 84 18 55' 8"                                   | 41 31' 70"  | +1' 52"          | 15 52' 20"    | +2' 13"          | 83 21 28' 25"   | -0' 12"                                   |
| Dec. 15 | S     | 92 54 28' 7"                                   | 46 23' 60"  | +1' 58"          | 15 37' 20"    | +2' 06"          | 91 52 24' 26"   | -0' 14"                                   |
| 1833.   |       |  |             |                  |               |                  |   |   |
| Jan. 6  | S     | 69 44 1' 2"                                    | 31 30' 10"  | +0' 64"          | 16 41' 50"    | +1' 97"          | 68 55 46' 99"   | -0' 10"                                   |
| 30      | S     | 74 9 19' 5"                                    | 33 48' 00"  | -1' 47"          | 15 54' 90"    | +0' 86"          | 73 19 37' 21"   | -0' 11"                                   |
| Feb. 2  | S     | 68 32 25' 0"                                   | 30 16' 70"  | -0' 38"          | 16 37' 20"    | +1' 41"          | 67 45 30' 07"   | -0' 10"                                   |
| 3       | N     | 70 2 35' 7"                                    | 31 51' 50"  | +0' 29"          | 16 43' 80"    | +1' 78"          | 69 47 29' 49"   | +0' 03"                                   |
| Mar. 4  | N     | 75 1 13' 8"                                    | 36 7' 50"   | -0' 46"          | 16 39' 50"    | +1' 41"          | 74 41 47' 67"   | +0' 04"                                   |
| 5       | N     | 79 52 58' 3"                                   | 40 4' 40"   | +0' 39"          | 16 37' 30"    | +1' 76"          | 79 29 32' 57"   | +0' 05"                                   |
| 6       | N     | 85 24 6' 9"                                    | 43 58' 00"  | +1' 31"          | 16 29' 90"    | +2' 09"          | 84 56 39' 58"   | +0' 06"                                   |
| Apr. 3  | N     | 88 11 41' 2"                                   | 45 33' 30"  | -0' 17"          | 16 21' 70"    | +1' 54"          | 87 42 31' 31"   | +0' 06"                                   |
| 5       | S     | 99 51 12' 2"                                   | 51 22' 20"  | +1' 66"          | 16 0' 90"     | +2' 08"          | 98 43 45' 36"   | -0' 15"                                   |
| 28      | N     | 75 27 2' 4"                                    | 35 31' 00"  | -0' 54"          | 16 12' 70"    | +1' 33"          | 75 7 45' 97"  | +0' 04"                                   |
| 29      | N     | 80 15 10' 4"                                   | 39 24' 60"  | -1' 02"          | 16 13' 60"    | +1' 16"          | 79 52 1' 58"  | +0' 05"                                   |
| 30      | N     | 85 39 37' 4"                                   | 43 21' 20"  | -1' 00"          | 16 11' 90"    | +1' 20"          | 85 12 30' 30"   | +0' 06"                                   |

*Greenwich Observations, 1834.*

| Mean Solar Time<br>of Observation of<br>Moon's Limb. | N.P.D. of Centre<br>at Transit of<br>Limb. | Correction<br>for<br>Motion. | N.P.D. of Centre<br>at Transit of<br>Centre. | Correction<br>for<br>Parallax. | Correction<br>for Semi-<br>diameter. | Corrected<br>Seconds of<br>N.P.D. |
|--|--|------------------------------|--|--------------------------------|--------------------------------------|-----------------------------------|
| 1834. d h m s  | ° ' "                                      |                              | ° ' "  | "                              | "                                    | "                                 |
| June 19 10 42 30' 9"                                 | 110° 27' 50' 55"                           | + 9' 56"                     | 110° 27' 60' 11"                             | - 2' 13"                       | - 0' 10"                             | 57' 88"                           |
| 20 11 39 51' 2"                                      | 113 8 14' 37"                              | + 5' 44"                     | 113 8 19' 81"                                | - 2' 02"                       | - 0' 13"                             | 17' 66"                           |
| 22 13 36 48' 4"                                      | 113 51 26' 46"                             | + 3' 33"                     | 113 51 29' 79"                               | - 1' 32"                       | - 0' 31"                             | 28' 16"                           |
| 30 19 36 9' 9"                                       | 81 18 8' 84"                               | -12' 00"                     | 81 17 56' 84"                                | - 0' 15"                       | - 0' 62"                             | 56' 07"                           |
| July 14 6 49 47' 7"                                  | 99 38 45' 98"                              | +15' 07"                     | 99 39 1' 05"                                 | - 1' 07"                       | - 0' 36"                             | 59' 62"                           |
| 15 7 41 10' 2"                                       | 104 51 45' 54"                             | +13' 24"                     | 104 51 58' 78"                               | - 0' 85"                       | - 0' 46"                             | 57' 47"                           |
| Aug. 22 14 47 8' 8"                                  | 89 53 9' 47"                               | -12' 39"                     | 89 52 57' 08"                                | - 0' 88"                       | - 0' 33"                             | 55' 87"                           |

## Greenwich Observations, 1834 (continued).

| Mean Solar Time<br>of Observation of<br>Moon's Limb. | N.P.D. of Centre<br>at Transit of<br>Limb. | Correction<br>for<br>Motion. | N.P.D. of Centre<br>at Transit of<br>Centre. | Correction<br>for<br>Parallax. | Correction<br>for Semi-<br>diameter. | Corrected<br>Seconds of<br>N.P.D. |
|--|--|------------------------------|--|--------------------------------|--------------------------------------|-----------------------------------|
| 1834. d h m s  | ° ' "                                      | "                            | ° ' "  | "                              | "                                    | "                                 |
| Sept. 11 7 12 19.3                                   | 114 32 29.92                               | - 0.87                       | 114 32 29.05                                 | + 1.18                         | + 1.02                               | 31.25                             |
| 12 8 7 11.9  | 114 9 12.77                                | + 3.12                       | 114 9 15.89                                  | + 1.67                         | + 1.15                               | 18.71                             |
| Oct. 13 9 19 31.9                                    | 102 58 48.70                               | - 11.50                      | 102 58 37.20                                 | + 2.05                         | + 1.26                               | 40.51                             |
| 15 10 42 37.4  | 93 14 40.59                                | - 12.51                      | 93 14 28.08                                  | + 1.33                         | + 1.09                               | 30.50                             |
| 16 11 22 47.8  | 88 7 43.66                                 | - 12.52                      | 88 7 31.14                                   | + 0.76                         | + 0.91                               | 32.81                             |
| Dec. 10 7 59 47.7                                    | 86 43 42.59                                | - 12.58                      | 86 43 30.01                                  | - 0.02                         | + 0.63                               | 30.62                             |
| 11 8 40 15.3   | 81 41 59.09                                | - 12.19                      | 81 41 46.90                                  | - 0.32                         | + 0.51                               | 47.09                             |
| 13 10 6 19.5   | 72 41 7.42                                 | - 10.24                      | 72 40 57.18                                  | - 0.94                         | + 0.18                               | 56.42                             |

## Greenwich Observations, 1836.

Uncorrected for R — D (discordance) (Colatitude  $38^{\circ} 31' 21''.93$ ).

| Year and<br>Day. | Apparent Zenith<br>Distance, Corrected<br>for Refraction. | Limb<br>Observed. | Parallax | Correc-<br>tion. | Semidiameter | Correc-<br>tion. | Geocentric N.P.D.<br>of Centre. |
|------------------|---|-------------------|----------|------------------|--------------|------------------|---------------------------------|
| 1836.            | ° ' "   |                   | ' "      | "                | ' "          | "                | ° ' "                           |
| Jan. 3           | 25 10 26.02   | N                 | 22 56.84 | + 1.21           | 14 50.01     | + 2.23           | 63 33 42.14                     |
| 7                | 37 22 35.79   | S                 | 33 51.67 | + 0.53           | 15 17.82     | + 1.72           | 75 4 50.69                      |
| Feb. 29          | 29 22 11.29   | N                 | 27 7.20  | + 0.93           | 15 11.27     | + 2.00           | 67 41 38.36                     |
| Mar. 6           | 64 0 6.85   | S                 | 52 41.29 | + 3.01           | 16 1.87      | + 2.49           | 101 22 40.12                    |
| 8                | 74 27 17.04   | S                 | 56 50.58 | + 2.17           | 16 7.46      | + 2.19           | 111 45 36.57                    |
| 26               | 25 31 39.39   | N                 | 23 24.24 | + 0.08           | 14 55.93     | + 1.52           | 63 54 34.45                     |
| 30               | 41 33 40.11   | N                 | 37 57.64 | + 0.48           | 15 40.91     | + 1.73           | 79 42 46.56                     |
| 31               | 47 49 0.82  | N                 | 42 58.57 | + 1.39           | 15 53.03     | + 2.07           | 85 53 17.89                     |
| Apr. 25          | 33 37 30.99   | N                 | 30 48.50 | - 0.95           | 15 16.03     | + 1.02           | 71 53 22.42                     |
| 26               | 38 44 5.25  | N                 | 35 21.20 | - 1.31           | 15 29.82     | + 0.95           | 76 55 38.06                     |
| 27               | 44 38 19.62   | N                 | 40 22.82 | - 1.23           | 15 44.72     | + 1.06           | 82 45 5.74                      |
| 28               | 51 5 47.48  | N                 | 45 27.37 | - 0.75           | 15 59.57     | + 1.30           | 89 7 43.66                      |

1836, Jan. 7. An additional correction of  $+ 4''.71$  is applied to the final result in consequence of a change of index error. (See Greenwich Observations, 1836, Introduction, page lxi).



## Greenwich Observations, 1836 and 1837 (continued).

Uncorrected for R — D (discordance) (Colatitude  $38^{\circ} 31' 21'' 93$ ).

| Year and Day.    | Apparent Zenith Distance, Corrected for Refraction. |     |                  | Limb Observed. | Parallax |               | Semidiameter. |               | Geocentric N.P.D. of Centre. |
|------------------|---|-----|------------------|----------------|----------|---------------|---------------|---------------|------------------------------|
|                  |   |     |                  |                |          | Correc- tion. |               | Correc- tion. |                              |
| 1836.<br>Apr. 29 | 57°   | 48' | 8"13             | N              | 50' 8"60 | +0"32         | 16' 12"84     | +1"68         | 95° 45' 35"66                |
| June 29          | {78   | 6   | 53"15            | N              | 59 34"70 | +2"68         | 16 38"14      | +2"37         | {115 55 18"21                |
|                  | {78   | 40  | 25"27            | S              | 59 42"23 | +2"69         |               |               | {115 55 21"77                |
| July 23          | 73  | 12  | 19"74            | N              | 56 55"54 | +2"64         | 16 15"16      | +2"33         | 111 3 0"98                   |
| 26               | 79  | 34  | 1"94             | S              | 59 48"10 | +4"25         | 16 36"78      | +2"78         | 116 48 51"96                 |
| Oct. 19          | 69  | 33  | 51"62            | S              | 54 38"04 | +4"31         | 15 56"30      | +2"82         | 106 54 32"08                 |
| 20               | 63  | 43  | 36"57            | S              | 51 54"65 | +4"67         | 15 49"92      | +2"97         | 101 7 6"29                   |
| 21               | 57  | 23  | 48"68            | S              | 48 22"48 | +5"04         | 15 42"77      | +3"17         | 94 50 57"15                  |
| 22               | 50  | 55  | 15"06            | S              | 44 10"03 | +4"66         | 15 34"58      | +3"15         | 88 26 44"57                  |
| 23               | {44   | 5   | 28"68            | N              | 39 11"55 | +3"97         | 15 25"93      | +3"07         | {82 13 4"09                  |
|                  | {44   | 36  | 51"00            | S              | 39 33"84 | +4"01         |               |               | {82 13 6"08                  |
| Dec. 15          | 54  | 53  | 34"69            | S              | 46 45"82 | +2"39         | 15 38"69      | +2"33         | 92 22 27"39                  |
| 1837.<br>Feb. 14 | 25  | 2   | 58"91            | S              | 22 48"77 | +0"54         | 14 48"98      | +1"79         | 62 56 40"76                  |
| 21               | 45  | 2   | 46"16            | S              | 38 44"62 | +1"71         | 14 59"85      | +2"13         | 82 40 19"78                  |
| Mar. 18          | 32  | 10  | 15"21            | N              | 28 45"39 | +0"21         | 14 49"52      | +1"57         | 70 27 42"63                  |
| 19               | 36  | 57  | 31"49            | N              | 32 41"36 | +0"72         | 14 54"65      | +1"79         | 75 11 7"78                   |
| 20               | 42  | 25  | 57"01            | N              | 36 59"02 | +1"56         | 15 1"30       | +2"10         | 80 35 21"76                  |
| Apr. 20          | {65   | 0   | 22"38            | S              | 51 48"79 | +4"21         | 15 37"93      | +2"80         | 102 24 {10"58                |
|                  | {64   | 28  | 46"65            | N              | 51 35"02 | +4"20         |               |               | {10"10                       |
| May 25           | 69  | 57  | 22"29            | N              | 55 30"02 | +4"66         | 16 9"14       | +2"92         | 107 49 21"60                 |
| June 14          | 65  | 0   | {26"34<br>26"41} | N              | 51 53"03 | +1"25         | 15 39"31      | +1"90         | 102 55 {35"20<br>35"27       |
|                  | 24  | 52  | {4"78<br>2"41}   | N              | 46 10"74 | +2"42         | 15 54"06      | +2"40         | 90 41 {10"01<br>7"64         |
| July 11          | 62  | 37  | {58"59<br>57"65} | N              | 49 53"77 | +2"42         | 15 22"08      | +2"92         | 100 34 {48"66<br>47"72       |
|                  | 13  | 73  | 21 50"47         | N              | 55 41"05 | +3"09         | 15 53"09      | +2"44         | 111 13 23"79                 |
| 15               | 80  | 16  | {46"00<br>44"41} | S              | 59 8"01  | +3"72         | 16 23"40      | +3"34         | 117 32 {30"18<br>28"59       |

In the bracketed numbers of the second and last columns, the upper belongs to TROUGHTON'S circle, and the lower to JONES'.

*Moon's Horizontal Equatoreal Parallax.*

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*Greenwich Observations 1837 (continued).*

Uncorrected for R — D (discordance) (Colatitude  $38^{\circ} 31' 21'' \cdot 93$ ).

| Year and Day. | Apparent Zenith Distance, Corrected for Refraction. | Limb Observed. | Parallax             | Correc- tion.  | Semidiameter | Correc- tion. | Geocentric N.P.D. of Centre. |
|---------------|---|----------------|----------------------|----------------|--------------|---------------|------------------------------|
| 1837.         | ° ' "   |                | ' "                  | "              | ' "          | "             | ° ' "                        |
| July 16       | 80 35 { 53'37<br>54'20 }                            | S              | 59 50'74             | +4'00          | 16 34'30     | +2'72         | 117 50 { 43'54<br>44'37 }    |
| Aug. 11       | { 79 1 33'44<br>79 34 1'25 }                        | N<br>S         | 57 42'69<br>57 49'23 | +5'36<br>+5'37 | 16 3'75      | +3'06         | 116 51 { 14'13<br>21'77 }    |
| 12            | 80 51 { 9'62<br>8'46 }                              | S              | 58 57'38             | +5'53          | 16 18'80     | +3'12         | 118 7 { 6'72<br>5'56 }       |
| Sept. 10      | 78 47 { 44'14<br>43'54 }                            | S              | 58 45'77             | +6'74          | 16 22'03     | +3'46         | 116 3 { 48'07<br>47'47 }     |
| Oct. 9        | 71 52 { 33'49<br>34'21 }                            | S              | 56 43'19             | +6'14          | 16 18'83     | +3'35         | 109 10 { 44'21<br>44'93 }    |
| 11            | 58 53 { 14'52<br>16'02 }                            | S              | 51 17'55             | +4'84          | 16 23'41     | +3'14         | 96 16 { 47'51<br>49'01 }     |
| 21            | 29 0 { 44'14<br>44'60 }                             | S              | 26 6'93              | —0'11          | 14 47'12     | +1'39         | 66 51 { 10'74<br>11'20 }     |
| Nov. 12       | 29 15 { 54'05<br>54'91 }                            | N              | 27 55'79             | +1'10          | 15 41'54     | +2'15         | 67 35 { 2'78<br>3'64 }       |
| 16            | 25 4 { 12'55<br>13'81 }                             | S              | 23 6'06              | —0'28          | 14 59'51     | +1'29         | 62 57 { 27'90<br>29'16 }     |
| Dec. 8        | 36 57 { 36'80<br>35'79 }                            | S              | 34 32'25             | +1'07          | 15 45'25     | +2'02         | 74 38 { 38'14<br>37'13 }     |

In the bracketed numbers of the second and last columns, the upper belongs to TAUGHTON'S circle, and the lower to JONES'.

Then, applying to each result the R — D correction, the numbers in the following table are obtained :—

*Greenwich Observations, 1836 and 1837 (corrected).*

| 1836.    | Geocentric N.P.D.<br>of Centre. | R-D.  | Corrected<br>Seconds. | 1836.    | Geocentric N.P.D.<br>of Centre. | R-D.  | Corrected<br>Seconds. |
|----------|---------------------------------|-------|-----------------------|----------|---------------------------------|-------|-----------------------|
| Jan. 3   | 63° 33' 42" 14                  | +0"45 | 42"59                 | April 29 | 95° 45' 35" 66                  | +0"30 | 35"96                 |
| 7        | 75 4 50 69                      | +0"45 | 51"14                 | June 29  | 115 55 18 21 }<br>21 77         | +0"09 | 20"08                 |
| Feb. 29  | 67 41 38 36                     | +0"46 | 38 82                 | July 23  | 111 3 0 98                      | +0"15 | 1"13                  |
| Mar. 6   | 101 22 40 12                    | +0"23 | 40 35                 | 26       | 116 48 51 96                    | +0"08 | 52 04                 |
| 8        | 111 45 36 57                    | +0"14 | 36 71                 | Oct. 19  | 106 54 32 08                    | +0"18 | 32 26                 |
| 26       | 63 54 34 45                     | +0"45 | 34 90                 | 20       | 101 7 6 29                      | +0"23 | 6 52                  |
| 30       | 79 42 46 56                     | +0"44 | 47 00                 | 21       | 94 50 57 15                     | +0"31 | 57 46                 |
| 31       | 85 53 17 89                     | +0"40 | 18 29                 | 22       | 88 26 44 57                     | +0"39 | 44 96                 |
| April 25 | 71 53 22 42                     | +0"46 | 22 88                 | 23       | 82 13 4 09 }<br>6 08            | +0"43 | 5 52                  |
| 26       | 76 55 38 06                     | +0"45 | 38 51                 | Dec. 15  | 92 22 27 39                     | +0"34 | 27 73                 |
| 27       | 82 45 5 74                      | +0"43 | 6 17                  |          |                                 |       |                       |
| 28       | 89 7 43 66                      | +0"39 | 44 05                 |          |                                 |       |                       |

*Greenwich Observations.*

| 1837.    | Geocentric N.P.D. of Centre. |       | R-D.  |       | Corrected Seconds. |       | Concluded N.P.D. |
|----------|------------------------------|-------|-------|-------|--------------------|-------|------------------|
|          | T.                           | J.    | T.    | J.    | T.                 | J.    |                  |
| Feb. 14  | 62° 56' 40" 76               | ..    | +0"51 | ..    | ..                 | ..    | 62° 56' 41" 27   |
| 21       | 82 40 19 78                  | ..    | +0"33 | ..    | ..                 | ..    | 82 40 20 11      |
| Mar. 18  | 70 27 42 63                  | ..    | +0"65 | ..    | ..                 | ..    | 70 27 43 28      |
| 19       | 75 11 7 78                   | ..    | +0"55 | ..    | ..                 | ..    | 75 11 8 33       |
| 20       | 80 35 21 76                  | ..    | +0"43 | ..    | ..                 | ..    | 80 35 22 19      |
| April 20 | 102 24 10 58                 | 10 10 | -0"40 | +0"11 | 10 18              | 10 21 | 102 24 10 20     |
| May 25   | 107 49 21 60                 | ..    | -0"40 | ..    | ..                 | ..    | 107 49 21 20     |
| June 14  | 102 55 35 20                 | 35 27 | -0"40 | +0"11 | 34 80              | 35 38 | 102 55 35 09     |
| 24       | 90 41 10 01                  | 7 64  | -0"03 | +0"19 | 9 98               | 7 83  | 90 41 8 91       |
| July 11  | 100 34 48 66                 | 47 72 | -0"40 | +0"12 | 48 26              | 47 84 | 100 34 48 05     |
| 13       | 111 13 23 79                 | ..    | -0"37 | ..    | ..                 | ..    | 111 13 23 42     |
| 15       | 117 32 30 18                 | 28 59 | -0"18 | +0"04 | 30 00              | 28 63 | 117 32 29 32     |
| 16       | 117 50 43 54                 | 44 37 | -0"16 | +0"04 | 43 38              | 44 41 | 117 50 43 90     |

*Moon's Horizontal Equatoreal Parallax.*

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*Greenwich Observations (continued).*

| 1837.    | Geocentric N.P.D. of Centre. |        | R-D.   |        | Corrected Seconds. |        | Concluded N.P.D. |
|----------|------------------------------|--------|--------|--------|--------------------|--------|------------------|
|          | T.                           | J.     | T.     | J.     | T.                 | J.     |                  |
| Aug. 11  | 116° 51' 14".13              | 21".77 | -0".19 | +0".04 | 13".94             | 21".81 | 116° 51' 17".88  |
| 12       | 118 7 6.72                   | 5.56   | -0.16  | +0.04  | 6.56               | 5.60   | 118 7 6.08       |
| Sept. 10 | 116 3 48.07                  | 47.47  | -0.22  | +0.05  | 47.85              | 47.52  | 116 3 47.69      |
| Oct. 9   | 109 10 44.21                 | 44.93  | -0.40  | +0.08  | 43.81              | 45.01  | 109 10 44.41     |
| 11       | 96 16 47.51                  | 49.01  | -0.24  | +0.15  | 47.27              | 49.16  | 96 16 48.22      |
| 21       | 66 51 10.74                  | 11.20  | +0.59  | +0.38  | 11.33              | 11.58  | 66 51 11.46      |
| Nov. 12  | 67 35 2.78                   | 3.64   | +0.61  | +0.38  | 3.39               | 4.02   | 67 35 3.70       |
| 16       | 62 57 27.90                  | 29.16  | +0.51  | +0.42  | 28.41              | 29.58  | 62 57 29.00      |
| Dec. 8   | 74 38 38.14                  | 37.13  | +0.55  | +0.30  | 38.69              | 37.43  | 74 38 38.06      |

*Cambridge Observations.*

| 1833.   | Limb observed. | N.P.D. corrected for Refraction. | Parallax.  |        | Semidiameter. |        | Geocentric N.P.D. | Small Correction for Parallax. |
|---------|----------------|----------------------------------|------------|--------|---------------|--------|-------------------|--------------------------------|
|         |                |                                  |            | Corr.  |               | Corr.  |                   |                                |
| Jan. 6  | S              | 69° 44' 45".6                    | 32' 11".00 | +0".65 | 16' 41".50    | +1".96 | 68° 55' 50".49    | -0".10                         |
| 28      | S              | 82 31 22.1                       | 39 33.70   | -0.55  | 15 23.90      | +1.30  | 81 36 23.75       | -0.12                          |
| 30      | S              | 74 '9 55.0                       | 34 24.90   | -1.50  | 15 54.90      | +0.86  | 73 19 35.84       | -0.11                          |
| Feb. 28 | S              | 69 46 59.8                       | 30 59.00   | -1.64  | 16 3.10       | +0.72  | 68 59 58.62       | -0.10                          |
| Mar. 4  | N              | 75 1 47.7                        | 36 45.70   | -0.46  | 16 39.50      | +1.41  | 74 41 43.37       | +0.04                          |
| 5       | N              | 79 53 34.7                       | 40 40.00   | +0.40  | 16 37.30      | +1.78  | 79 29 33.38       | +0.05                          |
| 28      | N              | 68 13 50.3                       | 29 28.40   | -0.63  | 15 58.40      | +1.22  | 68 0 22.15        | +0.03                          |
| 31      | N              | 73 1 49.8                        | 34 29.70   | -1.83  | 16 23.90      | +0.72  | 72 43 46.55       | +0.04                          |
| April 1 | N              | 77 20 46.5                       | 38 13.50   | -1.71  | 16 27.30      | +0.86  | 76 59 2.87        | +0.05                          |
| 3       | N              | 88 12 4.9                        | 46 3.30    | -0.15  | 16 21.70      | +1.53  | 87 42 24.98       | +0.06                          |
| 5       | S              | 99 51 28.2                       | 51 43.80   | +1.68  | 16 0.90       | +2.09  | 98 43 39.73       | -0.15                          |
| 26      | N              | 69 0 51.1                        | 30 23.60   | +0.37  | 16 5.70       | +1.77  | 68 46 34.60       | +0.03                          |
| 28      | N              | 75 27 34.7                       | 36 7.90    | -0.54  | 16 12.70      | +1.34  | 75 7 41.38        | +0.04                          |
| 29      | N              | 80 15 36.9                       | 39 59.00   | -1.03  | 16 13.60      | +1.16  | 79 51 53.69       | +0.05                          |
| 30      | N              | 85 40 3.7                        | 43 52.50   | -1.01  | 16 11.90      | +1.21  | 85 12 25.32       | +0.06                          |
| May 3   | N              | 101 58 26.4                      | 52 10.50   | +1.21  | 15 51.00      | +1.92  | 101 22 7.61       | +0.08                          |
| 4       | N              | 106 20 37.8                      | 53 20.50   | +2.16  | 15 40.10      | +2.17  | 105 42 57.41      | +0.08                          |
| 11      | N              | 106 18 55.1                      | 50 17.70   | +2.11  | 14 46.60      | +2.07  | 105 43 23.96      | +0.08                          |

## Cambridge Observations, 1834, 1836.

| Day.     | Limb observed. | Cor-<br>rection<br>for<br>Baro-<br>meter. | Cor-<br>rection<br>for<br>Paral-<br>lax. | Cor-<br>rection<br>for<br>Semi-<br>diameter. | Geocentric<br>N.P.D.<br>from the printed<br>Observations. | Corrected<br>N.P.D.<br>of<br>Moon's Centre. | Reduction<br>to<br>Greenwich<br>Catalogue<br>of<br>1439 Stars. | Corrected<br>Seconds. |
|----------|----------------|---|--|--|---|---|--|-----------------------|
| 1834.    |                |   |  |  |   |   |  |                       |
| June 19  | N              | +0.75                                     | +1.23                                    | +1.91  | 110° 27' 50.82  | 110° 27' 52.25                              | +0.64  | 52.82                 |
| 20       | S              | +0.98                                     | +1.41                                    | +1.95  | 113 8 15.52   | 113 8 13.14                                 | +0.64  | 13.71                 |
| 22       | N              | +1.05                                     | +0.94                                    | +1.78  | 113 51 26.29  | 113 51 26.39                                | +0.64  | 26.96                 |
| 22       | S              | +0.95                                     | +0.95                                    |  |   |   | +0.64  |                       |
| July 15  | N              | +0.64                                     | +2.34                                    | +2.25  | 104 51 52.11  | 104 51 52.66                                | +0.64  | 53.23                 |
| Oct. 13  | S              | +0.59                                     | +0.18                                    | +1.51  | 102 58 45.24  | 102 58 44.14                                | +0.64  | 44.71                 |
| 16       | S              | +0.39                                     | +1.18                                    | +1.85  | 88 7 42.74  | 88 7 40.10                                  | +0.64  | 40.67                 |
| Nov. 10  | S              | +0.52                                     | -0.50                                    | +1.30  | 100 0 6.39  | 100 0 6.11                                  | +0.64  | 6.68                  |
| 12       | S              | +0.40                                     | +0.17                                    | +1.50  | 89 55 23.71   | 89 55 22.44                                 | +0.64  | 23.01                 |
| Dec. 10  | S              | +0.38                                     | +0.25                                    | +1.53  | 86 43 35.62   | 86 43 34.22                                 | +0.64  | 34.79                 |
| 11       | S              | +0.34                                     | +0.44                                    | +1.61  | 81 41 52.63   | 81 41 50.92                                 | +0.64  | 51.49                 |
| 13       | S              | +0.28                                     | +1.10                                    | +1.98  | 72 41 3.07  | 72 41 0.27                                  | +0.64  | 0.84                  |
|          |                |   |  |  |   |   | Reduction<br>to Green-<br>wich Ob-<br>servations.              |                       |
| 1836.    |                |   |  |  |   |   |  |                       |
| Mar. 30  | N              | ..  | +0.49                                    | +1.73  | 79 42 38.72   | 79 42 39.96                                 | +1.39  | 41.28                 |
| 31       | N              | ..  | +1.41                                    | +2.06  | 85 53 9.66  | 85 53 10.31                                 | +1.39  | 11.63                 |
| April 25 | N              | ..  | -0.97                                    | +1.02  | 71 53 14.72   | 71 53 16.71                                 | +1.39  | 18.03                 |
| 27       | N              | ..  | -1.24                                    | +1.06  | 82 44 56.93   | 82 44 59.23                                 | +1.39  | 60.55                 |
| 29       | N              | ..  | +0.33                                    | +1.69  | 95 45 26.90   | 95 45 28.26                                 | +1.39  | 29.58                 |
| May 2    | S              | ..  | +3.74                                    | +2.65  | 112 55 55.15  | 112 55 48.76                                | +1.39  | 50.08                 |
| June 24  | N              | ..  | -0.12                                    | +1.54  | 102 23 10.07  | 102 23 11.73                                | +1.39  | 13.05                 |
| 26       | N              | ..  | +1.25                                    | +1.96  | 112 50 4.47   | 112 50 5.18                                 | +1.39  | 6.50                  |
| 29       | S              | ..  | +2.49                                    | +2.37  | 115 55 23.85  | 115 55 18.99                                | +1.39  | 20.31                 |
| Sept. 23 | S              | ..  | +6.05                                    | +3.43  | 98 41 53.96   | 98 41 44.48                                 | +1.39  | 45.80                 |
| Oct. 18  | S              | ..  | +3.68                                    | +2.61  | 111 49 44.16  | 111 49 37.87                                | +1.39  | 39.19                 |
| 19       | S              | ..  | +4.46                                    | +2.85  | 106 54 41.77  | 106 54 34.46                                | +1.39  | 35.78                 |

Note.—In the years 1834, 1836, and 1837, a correction of  $-0''.07$  has been applied to the Corrected Seconds, in order to reduce the Parallax to a compression of  $\frac{1}{15}$ .

1836, June 26. See note in the Cambridge Observations, p. 117.

*Cambridge Observations, 1836, 1837.*

| Year and Day. | Limb observed. | Correction for Parallax. | Correction for Semi-diameter. | Geocentric N.P.D. from the printed Observations. | Corrected N.P.D. of Moon's Centre. | Reduction to Greenwich Observations. | Corrected Seconds. |
|---------------|----------------|--------------------------|-------------------------------|--|------------------------------------|--------------------------------------|--------------------|
| 1836.         |                |                          |                               |  |                                    |                                      |                    |
| Oct. 20       | S              | +4'86                    | +3'02                         | 101° 7' 20"43                                    | 101° 7' 12"55                      | +1'39                                | 13'87              |
| 21            | S              | +4'97                    | +3'13                         | 94 51 8'16                                       | 94 51 0'06                         | +1'39                                | 1'38               |
| 22            | S              | +4'71                    | +3'15                         | 88 26 55'90                                      | 88 26 48'04                        | +1'39                                | 49'36              |
| 23            | S              | +4'05                    | +3'07                         | 82 13 17'76                                      | 82 13 10'64                        | +1'39                                | 11'96              |
| Nov. 19       | S              | +2'85                    | +2'55                         | 84 22 23'86                                      | 84 22 18'46                        | +1'39                                | 19'78              |
| Dec. 23       | N              | +0'37                    | +1'68                         | 62 40 47'37                                      | 62 40 48'68                        | +1'39                                | 50'00              |
| 1837.         |                |                          |                               |  |                                    |                                      |                    |
| Feb. 14       | S              | +0'55                    | -1'10                         | 62 56 40'89                                      | 62 56 41'44                        | +1'20                                | 42'57              |
| 21            | S              | +1'73                    | -0'76                         | 82 40 11'83                                      | 82 40 10'86                        | +1'20                                | 11'99              |
| 22            | S              | +1'85                    | -0'76                         | 88 33 39'56                                      | 88 33 38'47                        | +1'20                                | 39'60              |
| Mar. 18       | N              | +0'21                    | -1'32                         | 70 27 37'43                                      | 70 27 35'90                        | +1'20                                | 37'03              |
| 19            | N              | +0'73                    | -1'10                         | 75 11 2'04                                       | 75 11 0'21                         | +1'20                                | 1'34               |
| 20            | N              | +1'58                    | -0'79                         | 80 35 17'56                                      | 80 35 15'19                        | +1'20                                | 16'32              |
| April 14      | N              | -0'24                    | -1'57                         | 68 42 33'36                                      | 68 42 32'03                        | +1'20                                | 33'16              |
| 20            | S              | +4'23                    | } -0'09                       | 102 24 5'87                                      | 102 24 1'73                        | +1'20                                | 2'78               |
| 20            | N              | +4'22                    |                               |  | 1'56                               | +1'20                                |                    |
| June 14       | N              | +1'26                    | -0'99                         | 102 55 30'34                                     | 102 55 28'09                       | +1'20                                | 29'22              |
| 17            | S              | +3'62                    | -0'30                         | 116 30 47'41                                     | 116 30 44'09                       | +1'20                                | 45'22              |
| July 11       | N              | +2'44                    | -0'64                         | 100 34 44'73                                     | 100 34 41'65                       | +1'20                                | 42'78              |
| 14            | N              | +3'34                    | -0'38                         | 115 10 37'40                                     | 115 10 33'68                       | +1'20                                | 34'81              |
| 15            | S              | +3'72                    | -0'27                         | 117 32 29'02                                     | 117 32 25'57                       | +1'20                                | 26'70              |
| 16            | S              | +4'00                    | -0'18                         | 117 50 43'73                                     | 117 50 39'91                       | +1'20                                | 41'04              |
| Aug. 10       | N              | +5'19                    | +0'11                         | 113 49 48'72                                     | 113 49 43'64                       | +1'20                                | 44'77              |
| 11            | N              | +5'37                    | +0'17                         | 116 51 18'27                                     | 116 51 13'07                       | +1'20                                | 14'20              |
| 12            | S              | +5'54                    | +0'22                         | 118 7 10'51                                      | 118 7 4'75                         | +1'20                                | 5'88               |
| 13            | S              | +5'46                    | +0'20                         | 117 16 10'55                                     | 117 16 4'89                        | +1'20                                | 6'02               |
| Sept. 10      | S              | +6'75                    | +0'57                         | 116 3 54'48                                      | 116 3 47'16                        | +1'20                                | 48'29              |
| Oct. 9        | S              | +6'16                    | +0'46                         | 109 10 51'92                                     | 109 10 45'30                       | +1'20                                | 46'43              |

*Cambridge Observations (continued).*

| Year and Day. | Limb observed. | Correction for Parallax. | Correction for Semi-diameter. | Geocentric N.P.D. from the printed Observations. | Corrected N.P.D. of Moon's Centre. | Reduction to Greenwich Observations. | Corrected Seconds. |
|---------------|----------------|--------------------------|-------------------------------|--|------------------------------------|--------------------------------------|--------------------|
| 1837.         |                |                          |                               |  |                                    |                                      |                    |
| Oct. 11       | S              | +4".88                   | +0".25                        | 96° 16' 57".06                                   | 96° 16' 51".93                     | +1".20                               | 53".06             |
| 21            | S              | -0".10                   | -1".49                        | 66 51 3".60                                      | 66 51 5".19                        | +1".20                               | 6".32              |
| Nov. 12       | N              | +1".12                   | -0".74                        | 67 35 7".25                                      | 67 35 5".39                        | +1".20                               | 6".52              |
| Dec. 8        | S              | +1".08                   | -0".87                        | 74 38 40".30                                     | 74 38 40".09                       | +1".20                               | 41".22             |
| 12            | N              | +0".50                   | -1".07                        | 61 45 49".15                                     | 61 45 47".58                       | +1".20                               | 48".71             |

*Edinburgh Observations.*

With BESSEL's Refractions (the correction of  $+0''.2$  has been applied to the Zenith Point for the mean difference of the Refractions of BESSEL and IVORY).

Mr. MAIN's corrections of BESSEL's Refractions have also been applied.

| Date.            | Limb Observed. | N.P.D. of Limb Corrected for Refraction. | Parallax. | Semidiameter. | N.P.D. of Centre at Transit of Centre. | Small Correction for Parallax. |
|------------------|----------------|--|-----------|---------------|--|--------------------------------|
| 1834.<br>Nov. 15 | S              | 76° 5' 41".5                             | 36' 9".61 | 14' 49".25    | 75° 14' 42".64                         | — 0".12                        |
| Dec. 10          | S              | 87 38 56.1                               | 43 21.66  | 14 46.23      | 86 40 48.21                            | — 0".14                        |
| 1836.<br>Jan. 3  | N              | 63 45 49.6                               | 26 48.3   | 14 52.3       | 63 33 53.6                             | + 0".03                        |
| Feb. 26          | N              | 63 34 9.6                                | 26 36.3   | 14 51.0       | 63 22 24.3                             | + 0".03                        |
| Mar. 26          | N              | 64 7 43.0                                | 27 15.9   | 14 57.6       | 63 55 24.7                             | + 0".03                        |
| 30               | N              | 80 11 29.2                               | 41 17.8   | 15 42.8       | 79 45 54.2                             | + 0".06                        |
| Apr. 24          | N              | 68 7 23.8                                | 30 46.1   | 15 5.5        | 67 51 43.2                             | + 0".04                        |
| 25               | N              | 72 14 56.3                               | 34 25.2   | 15 17.1       | 71 55 48.2                             | + 0".05                        |
| 26               | N              | 77 21 47.6                               | 38 46.9   | 15 31.0       | 76 58 31.7                             | + 0".05                        |
| 28               | N              | 89 43 28.4                               | 48 14.9   | 16 1.0        | 89 11 14.5                             | + 0".07                        |
| 29               | N              | 96 25 26.8                               | 52 31.6   | 16 14.7       | 95 49 9.9                              | + 0".08                        |
| July 26          | S              | 118 5 20.5                               | 60 27.7   | 16 39.5       | 116 48 13.3                            | — 0".16                        |
| Aug. 22          | S              | 118 32 26.3                              | 59 41.4   | 16 24.6       | 117 16 20.3                            | — 0".16                        |
| Sept. 20         | S              | 115 34 29.8                              | 58 39.9   | 16 14.0       | 114 19 35.9                            | — 0".15                        |
| Oct. 19          | S              | 108 3 42.4                               | 56 7.3    | 15 59.1       | 106 51 36.0                            | — 0".15                        |
| 21               | S              | 95 53 58.4                               | 50 43.6   | 15 45.9       | 94 47 28.9                             | — 0".15                        |
| 24               | S              | 77 17 34.4                               | 38 16.3   | 15 19.9       | 76 23 58.2                             | — 0".12                        |
| Dec. 15          | S              | 93 23 58.1                               | 49 13.4   | 15 40.9       | 92 19 3.8                              | — 0".15                        |
| 19               | S              | 70 51 40.4                               | 32 45.5   | 15 1.0        | 70 3 53.9                              | — 0".11                        |
| 23               | N              | 62 52 20.2                               | 25 49.5   | 14 44.1       | 62 41 14.8                             | + 0".03                        |



*Interpolated North Polar Distances of the Moon.*

| Greenwich Mean Solar<br>Time of Transit of Centre. | Interpolated<br>N.P.D.<br>of Moon<br>(Greenwich.) | Cape Mean Solar<br>Time of Transit of Centre. | Interpolated<br>N.P.D.<br>of Moon<br>(Cape.) | Greenwich<br>—<br>Cape. |
|--|---|---|--|-------------------------|
| 1836. d h m s                                      |   | 1836. d h m s                                 |  |                         |
| Jan. 3 12 4 13.2                                   | 63° 33' 40".48                                    | Jan. 3 12 1 33.8                              | 63° 32' 38".11                               | + 1' 2".37              |
| 7 15 23 1.8  | 75 4 49.82  | 7 15 20 38.5                                  | 74 49 35.25                                  | +15 14.57               |
| Feb. 29 10 23 4.6                                  | 67 41 32.17                                       | Feb. 29 10 20 29.5                            | 67 31 6.07                                   | +10 26.10               |
| Mar. 6 15 9 42.8                                   | 101 22 40.70                                      | Mar. 6 15 7 9.4                               | 101 4 5.94                                   | +18 34.76               |
| 8 16 55 55.1                                       | 111 45 46.74                                      | 8 16 53 0.5                                   | 111 33 4.05                                  | +12 42.69               |
| 26 7 22 6.0  | 63 54 29.49                                       | 26 7 19 26.1                                  | 63 49 47.89                                  | + 4 41.60               |
| 30 10 38 28.5                                      | 79 42 40.12                                       | 30 10 36 4.0                                  | 79 24 35.37                                  | +18 4.75                |
| 31 11 25 23.8                                      | 85 53 13.85                                       | 31 11 22 59.2                                 | 85 33 30.39                                  | +19 43.46               |
| Apr. 25 7 41 32.3                                  | 71 53 18.21                                       | Apr. 25 7 39 6.7                              | 71 39 17.13                                  | +14 1.08                |
| 26 8 28 20.8                                       | 76 55 32.86                                       | 26 8 25 58.1                                  | 76 38 46.83                                  | +16 46.03               |
| 27 9 14 35.0                                       | 82 45 1.84  | 27 9 12 12.8                                  | 82 26 9.27                                   | +18 52.57               |
| 28 10 1 11.8                                       | 89 7 39.70  | 28 9 58 46.7                                  | 88 47 28.64                                  | +20 11.06               |
| 29 10 49 19.2                                      | 95 45 33.89                                       | 29 10 46 47.8                                 | 95 25 6.36                                   | +20 27.53               |
| June 29 13 13 55.8                                 | 115 55 24.13                                      | June 29 13 10 33.5                            | 116 2 8.15                                   | — 6 44.02               |
| July 23 7 40 53.8                                  | 111 3 3.87  | July 23 7 37 58.9                             | 110 49 6.26                                  | +13 57.61               |
| 26 10 51 27.3                                      | 116 48 55.41                                      | 26 10 48 2.6                                  | 116 52 23.91                                 | — 3 28.50               |
| Oct. 19 8 14 33.6                                  | 106 54 29.48                                      | Oct. 19 8 11 54.9                             | 107 11 7.38                                  | —16 37.90               |
| 20 9 4 15.2  | 101 7 5.02  | 20 9 1 47.1                                   | 101 25 48.40                                 | —18 43.38               |
| 21 9 51 3.7  | 94 50 51.43                                       | 21 9 48 42.8                                  | 95 10 31.82                                  | —19 40.39               |
| 22 10 36 9.5                                       | 88 26 39.16                                       | 22 10 33 52.1                                 | 88 46 16.04                                  | —19 36.88               |
| 23 11 20 42.1                                      | 82 13 1.05  | 23 11 18 24.9                                 | 82 31 39.92                                  | —18 38.87               |
| Dec. 15 6 32 48.9                                  | 92 22 20.99                                       | Dec. 15 6 30 31.6                             | 92 41 50.79                                  | —19 29.80               |
| 1837.  |   | 1837.   |  |                         |
| Feb. 14 7 49 57.1                                  | 62 56 40.51                                       | Feb. 14 7 47 20.3                             | 63 1 4.56                                    | — 4 24.05               |
| 21 13 20 24.0                                      | 82 40 17.76                                       | 21 13 18 15.6                                 | 82 22 38.20                                  | +17 39.56               |
| Mar. 18 9 50 49.1                                  | 70 27 42.68                                       | Mar. 18 9 48 30.1                             | 70 14 29.38                                  | +13 13.30               |
| 19 10 34 58.2                                      | 75 11 6.61  | 19 10 32 45.1                                 | 74 55 28.02                                  | +15 38.59               |

*Interpolated North Polar Distances of the Moon (continued).*

| Greenwich Mean Solar<br>Time of Transit of Centre. | Interpolated<br>N.P.D.<br>of Moon<br>(Greenwich.) | Cape Mean Solar<br>Time of Transit of Centre. | Interpolated<br>N.P.D.<br>of Moon<br>(Cape.) | Greenwich<br>—<br>Cape. |
|--|---|---|--|-------------------------|
| 1837. d h m s                                      | ° ' "   | 1837. d h m s                                 | ° ' "  | ' "                     |
| Mar. 20 11 17 36.1                                 | 80 35 20.85                                       | Mar. 20 11 15 26.5                            | 80 17 54.23                                  | + 17 26.62              |
| Apr. 20 12 5 24.5                                  | 102 24 8.61                                       | Apr. 20 12 2 59.8                             | 102 5 48.41                                  | + 18 20.20              |
| May 25 17 39 58.0                                  | 107 49 18.63                                      | May 25 17 37 13.3                             | 108 6 13.91                                  | — 16 55.28              |
| June 14 8 32 39.6                                  | 102 55 41.65                                      | June 14 8 30 15.0                             | 102 37 58.69                                 | + 17 42.96              |
| 24 18 3 27.1                                       | 90 41 2.27  | 24 18 1 5.1                                   | 91 1 32.29                                   | — 20 30.02              |
| July 11 6 24 28.1                                  | 100 34 53.45                                      | July 11 6 22 12.4                             | 100 16 58.35                                 | + 17 55.10              |
| 13 8 1 39.0  | 111 13 30.08                                      | 13 7 58 53.9                                  | 110 59 20.62                                 | + 14 9.46               |
| 15 10 0 52.8                                       | 117 32 36.54                                      | 15 9 57 33.8                                  | 117 28 8.76                                  | + 4 27.78               |
| 16 11 6 59.9                                       | 117 50 49.42                                      | 16 11 3 34.3                                  | 117 53 10.76                                 | — 2 21.34               |
| Aug. 11 7 42 52.2                                  | 116 51 20.14                                      | Aug. 11 7 39 45.5                             | 116 44 21.76                                 | + 6 58.38               |
| 12 8 45 47.6                                       | 118 7 7.92  | 12 8 42 28.8                                  | 118 6 12.47                                  | + 55.45                 |
| Sept. 10 8 37 28.8                                 | 116 3 43.49                                       | Sept. 10 8 34 16.4                            | 116 12 54.26                                 | — 9 10.77               |
| Oct. 9 8 23 56.1                                   | 109 10 41.77                                      | Oct. 9 8 21 5.4                               | 109 27 31.47                                 | — 16 49.70              |
| 11 10 8 52.0                                       | 96 16 43.81                                       | 11 10 6 17.6                                  | 96 38 32.70                                  | — 21 48.89              |
| 21 18 46 9.9                                       | 66 51 12.51                                       | 21 18 43 45.2                                 | 66 40 17.82                                  | + 10 54.69              |
| Nov. 12 12 8 27.9                                  | 67 34 58.39                                       | Nov. 12 12 5 42.9                             | 67 48 16.71                                  | — 13 18.32              |
| 16 15 47 53.1                                      | 62 57 31.03                                       | 16 15 45 12.3                                 | 62 51 38.32                                  | + 5 52.71               |
| Dec. 8 9 8 41.2                                    | 74 38 31.65                                       | Dec. 8 9 6 10.9                               | 74 56 10.54                                  | — 17 38.89              |

*Increase of the Interpolated North Polar Distance of the Moon, in the interval between the Transits over the Greenwich and Cape Meridians, and Cambridge and the Cape.*

1832 and 1833. (From Professor HENDERSON's Memoir).

| Date.           | Greenwich —<br>Cape<br>Δ N.P.D. | Date.   | Greenwich —<br>Cape<br>Δ N.P.D. | Date.            | Cambridge —<br>Cape<br>Δ N.P.D. |
|-----------------|---------------------------------|---|---------------------------------|------------------|---------------------------------|
| 1832.<br>May 18 | — 1' 29"40                      | 1833.<br>Feb. 2   | + 1' 46"40                      | 1833.<br>Feb. 28 | — 5' 3"96                       |
| 19              | — 4 26'90                       | 3   | + 7 0'20                        | Mar. 4           | + 13 7'94                       |
| June 10         | + 10 44'00                      | Mar. 4  | + 13 12'00                      | 5                | + 15 53'07                      |
| July 8          | + 9 13'40                       | 5   | + 15 57'90                      | 28               | — 2 7'92                        |
| 20              | — 14 19'00                      | 6   | + 17 18'70                      | 31               | + 11 13'73                      |
| Aug. 10         | — 7 5'70                        | Apr. 3  | + 17 32'50                      | Apr. 1           | + 14 29'64                      |
| 11              | — 9 32'50                       | 5   | + 15 43'40                      | 3                | + 17 27'19                      |
| Sept. 30        | + 2 51'90                       | 28  | + 13 13'60                      | 5                | + 15 38'58                      |
| Oct. 12         | — 10 51'90                      | 29  | + 15 39'10                      | 26               | + 5 36'16                       |
| Nov. 2          | — 11 30'70                      | 30  | + 17 0'30                       | 28               | + 13 9'54                       |
| 6               | — 15 7'00                       | Cambridge and the Cape (cor-<br>rected for the difference of<br>longitude). |                                 | 29               | + 15 34'27                      |
| 16              | + 15 23'20                      |   |                                 | 30               | + 16 55'09                      |
| Dec. 15         | + 15 36'60                      | 1833.<br>Jan. 6   | + 4 42'24                       | May 3            | + 14 37'37                      |
| 1833.<br>Jan. 6 | + 4 43'80                       | 28  | — 14 2'16                       | 4                | + 12 1'65                       |
| 30              | — 10 51'20                      | 30  | — 10 47'93                      | 11               | — 10 26'43                      |

1832, Nov. 6. Δ N.P.D. is in error in Prof. HENDERSON's Memoir.

*Interpolated North Polar Distances of the Moon.*

| GREENWICH.                      |                            |                        |  | CAPE.                                  |                   |
|---------------------------------|----------------------------|------------------------|--|--|-------------------|
| G.M.T. Time of Transit of Limb. | N.P.D. at Transit of Limb. | Correction for Change. | N.P.D. of Centre at Transit of Centre. | N.P.D. of Centre at Transit of Centre. | Greenwich — Cape. |
| 1834. d h m s                   |                            |                        |  |  |                   |
| June 19 10 42 30.9              | 110° 27' 50".38            | + 9".56                | 110° 27' 59".94                        | 110° 17' 26".94                        | + 10' 33".00      |
| 20 11 39 51.2                   | 113 8 12.65                | + 5.44                 | 113 8 18.09                            | 113 2 15.91                            | + 6 2.18          |
| 22 13 36 48.4                   | 113 51 26.81               | + 3.33                 | 113 51 30.14                           | 113 54 55.85                           | — 3 25.71         |
| 30 19 36 9.9                    | 81 18 3.95                 | — 12.00                | 81 17 51.95                            | 81 33 2.74                             | — 15 10.79        |
| July 14 6 49 47.7               | 99 38 44.65                | + 15.07                | 99 38 59.72                            | 99 21 49.96                            | + 17 9.76         |
| 15 7 41 10.2                    | 104 51 43.90               | + 13.24                | 104 51 57.14                           | 104 37 2.37                            | + 14 54.77        |
| Aug. 22 14 47 8.8               | 89 53 6.48                 | — 12.39                | 89 52 54.09                            | 90 8 50.79                             | — 15 56.70        |
| Sept. 11 7 12 19.3              | 114 32 30.41               | — 0.87                 | 114 32 29.54                           | 114 31 22.69                           | + 1 6.85          |
| 12 8 7 11.9                     | 114 9 15.38                | + 3.12                 | 114 9 18.50                            | 114 12 27.23                           | — 3 8.73          |
| Oct. 13 9 19 31.9               | 102 58 50.55               | — 11.50                | 102 58 39.05                           | 103 12 31.50                           | — 13 52.45        |
| 15 10 42 37.4                   | 93 14 42.05                | — 12.51                | 93 14 29.54                            | 93 30 10.14                            | — 15 40.60        |
| 16 11 22 47.8                   | 88 7 42.87                 | — 12.52                | 88 7 30.35                             | 88 23 15.05                            | — 15 44.70        |
| Dec. 10 7 59 47.7               | 86 43 36.55                | — 12.58                | 86 43 23.97                            | 86 59 9.46                             | — 15 45.49        |
| 11 8 40 15.3                    | 81 41 53.17                | — 12.19                | 81 41 40.98                            | 81 56 50.74                            | — 15 9.76         |
| 13 10 6 19.5                    | 72 41 1.80                 | — 10.24                | 72 40 51.56                            | 72 53 6.31                             | — 12 14.75        |

*Edinburgh Observations (continued).*

| Date.   | Limb Observed. | N.P.D. of Limb Corrected for Refraction. | Parallax. | Semidiameter. | N.P.D. of Centre at Transit of Centre. | Small Correction for Parallax. |
|---------|----------------|--|-----------|---------------|--|--------------------------------|
| 1837.   |                |  |           |               |  |                                |
| Feb. 14 | S              | 63° 37' 24"                              | 26' 38"   | 14' 50"       | 62° 55' 55"                            | — 0".10                        |
| 15      | N              | 62 24 56.5                               | 25 30.7   | 14 46.3       | 62 14 12.1                             | + 0.03                         |
| 16      | N              | 63 6 8.6                                 | 26 1.4    | 14 44.5       | 62 54 51.7                             | + 0.03                         |
| 21      | S              | 83 40 7.6                                | 41 45.4   | 15 2.1        | 82 43 20.1                             | — 0.13                         |
| Mar. 19 | N              | 75 34 56.9                               | 36 5.7    | 14 56.6       | 75 13 47.8                             | + 0.05                         |
| 20      | N              | 81 3 28.3                                | 40 8.8    | 15 3.5        | 80 38 23.0                             | + 0.06                         |
| June 14 | N              | 103 36 41.7                              | 53 40.7   | 15 41.4       | 102 58 42.4                            | + 0.09                         |
| July 14 | N              | 115 54 45.5                              | 58 34.9   | 16 11.8       | 115 12 22.4                            | + 0.09                         |
| 15      | S              | 118 49 23.3                              | 59 48.8   | 16 26.1       | 117 33 8.4                             | — 0.16                         |
| Oct. 11 | S              | 97 23 6.5                                | 53 37.8   | 16 26.5       | 96 13 2.2                              | — 0.15                         |
| 21      | S              | 67 37 43.0                               | 29 48.7   | 14 48.7       | 66 53 5.6                              | — 0.10                         |
| Nov. 12 | N              | 67 48 54.2                               | 31 48.5   | 15 43.6       | 67 32 49.3                             | + 0.04                         |
| Dec. 9  | S              | 70 11 50.0                               | 33 37.5   | 15 39.4       | 69 22 33.1                             | — 0.11                         |
| 11      | N              | 62 56 20.9                               | 26 59.8   | 15 22.2       | 62 44 43.3                             | + 0.03                         |
| 12      | N              | 61 56 22.2                               | 25 52.7   | 15 13.2       | 61 45 42.7                             | + 0.03                         |

SECTION V.—*Interpolated Places.**Greenwich and Cape of Good Hope (FALLOWS, 1830.)*

Interpolated North Polar Distances.

| Greenwich M.S.T. of<br>Transit of<br>Moon's Limb. | Interpolated<br>N.P.D. of<br>Moon. | Cape M.S.T. of<br>Transit of<br>Moon's Limb. | Interpolated<br>N.P.D. of<br>Moon. | Greenwich —<br>Cape. Motion<br>in N.P.D. |
|---|------------------------------------|--|------------------------------------|--|
| 1830. d h m s<br>Apr. 3 8 59 6.3                  | 78° 52' 51".85                     | 1830. d h m s<br>Apr. 3 8 56 45.6            | 78° 43' 7".40                      | + 9' 44".45                              |
| 4 9 43 41.1                                       | 82 15 17.61                        | 4 9 41 25.5                                  | 82 4 23.28                         | +10 54.33                                |
| 5 10 26 57.6                                      | 85 55 35.54                        | 5 10 24 44.9                                 | 85 43 59.59                        | +11 35.95                                |
| 6 11 9 27.7                                       | 89 44 40.29                        | 6 11 7 16.4                                  | 89 32 50.16                        | +11 50.13                                |
| May 1 7 41 56.2                                   | 80 58 53.59                        | May 1 7 39 38.9                              | 80 48 13.12                        | +10 40.47                                |
| 3 9 8 14.4  | 88 24 16.60                        | 3 9 6 3.3                                    | 88 12 24.91                        | +11 51.69                                |
| 4 9 50 24.0                                       | 92 15 28.74                        | 4 9 48 13.6                                  | 92 3 40.07                         | +11 48.67                                |
| Aug. 4 12 28 47.1                                 | 103 30 34.65                       | Aug. 4 12 26 1.1                             | 103 40 28.36                       | — 9 53.71                                |
| 5 13 22 24.1                                      | 99 51 52.94                        | 5 13 19 39.1                                 | 100 4 11.75                        | —12 18.81                                |

*Interpolated North Polar Distances of the Moon.*

| Greenwich Mean Solar Time.                                  |    |    |      |                | Cape Mean Solar Time.                                  |    |    |      |                |
|---|----|----|------|----------------|--|----|----|------|----------------|
| Interpolated N.P.D. at Transit of Moon's Centre. Cambridge. |    |    |      |                | Interpolated N.P.D. at Transit of Moon's Centre. Cape. |    |    |      |                |
| Cambridge — Cape.   |    |    |      |                |  |    |    |      |                |
| 1834. d   | h  | m  | s    |                | 1834. d  | h  | m  | s    |                |
| June 19   | 10 | 43 | 18.0 | 110° 27' 56.80 | June 19  | 10 | 40 | 47.8 | 110° 17' 26.94 |
| 20  | 11 | 40 | 39.1 | 113 8 16.35    | 20   | 11 | 38 | 5.0  | 113 2 15.91    |
| 22  | 13 | 35 | 13.7 | 113 51 31.19   | 22   | 13 | 32 | 45.7 | 113 54 55.85   |
| July 15   | 7  | 41 | 55.1 | 104 51 52.62   | July 15  | 7  | 39 | 37.8 | 104 37 2.37    |
| Oct. 13   | 9  | 20 | 11.2 | 102 58 43.37   | Oct. 13  | 9  | 18 | 21.4 | 103 12 31.50   |
| 16  | 11 | 23 | 24.0 | 88 7 35.37     | 16   | 11 | 21 | 44.6 | 88 23 15.05    |
| Nov. 10   | 8  | 1  | 23.5 | 100 0 4.48     | Nov. 10  | 7  | 59 | 38.1 | 100 14 49.72   |
| 12  | 9  | 22 | 36.8 | 89 55 18.95    | 12   | 9  | 20 | 57.5 | 90 11 4.59     |
| Dec. 10   | 8  | 0  | 24.5 | 86 43 28.92    | Dec. 10  | 7  | 58 | 44.9 | 86 59 9.46     |
| 11  | 8  | 40 | 52.6 | 81 41 45.73    | 11   | 8  | 39 | 10.1 | 81 56 50.74    |
| 13  | 10 | 6  | 59.8 | 72 40 55.35    | 13   | 10 | 5  | 3.4  | 72 53 6.31     |
| 1836. d   | h  | m  | s    |                | 1836. d  | h  | m  | s    |                |
| Mar. 30   | 10 | 38 | 4.8  | 79 42 34.50    | Mar. 30  | 10 | 36 | 4.0  | 79 24 35.37    |
| 31  | 11 | 25 | 0.1  | 85 53 7.73     | 31   | 11 | 22 | 59.2 | 85 33 30.39    |
| Apr. 25   | 7  | 41 | 9.0  | 71 53 13.90    | Apr. 25  | 7  | 39 | 6.7  | 71 39 17.13    |
| 27  | 9  | 14 | 11.3 | 82 44 56.07    | 27   | 9  | 12 | 12.8 | 82 26 9.27     |
| 29  | 10 | 48 | 55.7 | 95 45 27.62    | 29   | 10 | 46 | 47.8 | 95 25 6.36     |
| May 2   | 13 | 33 | 43.5 | 112 55 55.08   | May 2  | 13 | 30 | 59.5 | 112 43 29.16   |
| June 24   | 8  | 3  | 42.6 | 102 23 16.69   | June 24  | 8  | 1  | 30.8 | 102 4 44.17    |
| 26  | 9  | 53 | 0.1  | 112 50 10.87   | 26   | 9  | 42 | 45.8 | 112 38 5.21    |
| 29  | 13 | 13 | 31.8 | 115 55 26.28   | 29   | 13 | 10 | 33.5 | 116 2 8.15     |
| Sept. 23  | 11 | 9  | 40.8 | 98 41 37.60    | Sept. 23   | 11 | 7  | 36.6 | 99 1 8.01      |
| Oct. 18   | 7  | 20 | 37.6 | 111 49 37.69   | Oct. 18  | 7  | 18 | 10.2 | 112 2 49.66    |
| 19  | 8  | 14 | 10.8 | 106 54 34.44   | 19   | 8  | 11 | 54.9 | 107 11 7.38    |
| 20  | 9  | 3  | 52.0 | 101 7 10.73    | 20   | 9  | 1  | 47.1 | 101 25 48.40   |
| 21  | 9  | 50 | 40.5 | 94 50 57.41    | 21   | 9  | 48 | 42.8 | 95 10 31.82    |
| 22  | 10 | 35 | 46.1 | 88 26 45.16    | 22   | 10 | 33 | 52.1 | 88 46 16.04    |
| 23  | 11 | 20 | 18.4 | 82 13 6.84     | 23   | 11 | 18 | 24.9 | 82 31 39.92    |

## Interpolated North Polar Distances of the Moon (continued).

| Greenwich Mean Solar Time.        | Interpolated N.P.D. at Transit of Moon's Centre. Cambridge. | Cape Mean Solar Time.              | Interpolated N.P.D. at Transit of Moon's Centre. Cape. | Cambridge - Cape. |
|-----------------------------------|---|------------------------------------|--|-------------------|
| 1836. d h m s<br>Nov. 19 9 17 6.7 | 84° 22' 14.83   | 1836. d h m s<br>Nov. 19 9 15 16.4 | 84° 40' 52.87  | -18' 38.04        |
| Dec. 23 12 49 53.3                | 62 40 49.27   | Dec. 23 12 47 39.5                 | 62 38 27.88  | + 2 21.39         |
| 1837.<br>Feb. 14 7 49 33.5        | 62 56 41.85   | 1837.<br>Feb. 14 7 47 20.3         | 63 1 4.56  | - 4 22.71         |
| 21 13 20 0.5                      | 82 40 12.36   | 21 13 18 15.6                      | 82 22 38.20  | +17 34.16         |
| 22 14 1 26.3                      | 88 33 39.03   | 22 13 59 41.8                      | 88 15 16.13  | +18 22.90         |
| Mar. 18 9 50 25.5                 | 70 27 38.54   | Mar. 18 9 48 30.1                  | 70 14 29.38  | +13 9.16          |
| 19 10 34 34.7                     | 75 11 1.74  | 19 10 32 45.1                      | 74 55 28.02  | +15 33.72         |
| 20 11 17 12.7                     | 80 35 15.43   | 20 11 15 26.5                      | 80 17 54.23  | +17 21.20         |
| Apr. 14 7 44 23.7                 | 68 42 36.66   | Apr. 14 7 42 26.2                  | 68 30 36.11  | +12 0.55          |
| 20 12 5 1.0                       | 102 24 2.98   | 20 12 2 59.7                       | 102 5 48.41  | +18 14.57         |
| June 14 8 32 16.4                 | 102 55 36.15  | June 14 8 30 15.0                  | 102 37 58.69   | +17 37.46         |
| 17 11 17 16.6                     | 116 30 51.10  | 17 11 14 26.5                      | 116 23 11.76   | + 7 39.34         |
| July 11 6 24 5.0                  | 100 34 47.98  | July 11 6 22 12.4                  | 100 16 58.35   | +17 49.63         |
| 14 8 58 3.4                       | 115 10 44.45  | 14 8 55 23.6                       | 115 0 39.65  | +10 4.80          |
| 15 10 0 29.2                      | 117 32 35.21  | 15 9 57 33.8                       | 117 28 8.76  | + 4 26.45         |
| 16 11 6 36.2                      | 117 50 50.21  | 16 11 3 34.3                       | 117 53 10.76   | - 2 20.55         |
| Aug. 10 6 44 21.2                 | 113 49 48.13  | Aug. 10 6 41 55.4                  | 113 38 13.00   | +11 35.13         |
| 11 7 42 28.4                      | 116 51 18.04  | 11 7 39 45.5                       | 116 44 21.76   | + 6 56.28         |
| 12 8 45 24.3                      | 118 7 7.70  | 12 8 42 28.9                       | 118 6 12.47  | + 55.23           |
| 13 9 50 46.0                      | 117 16 7.46   | 13 9 47 48.8                       | 117 21 56.67   | - 5 49.21         |
| Sept. 10 8 37 5.3                 | 116 3 46.34   | Sept. 10 8 34 16.4                 | 116 12 54.26   | - 9 7.92          |
| Oct. 9 8 23 33.2                  | 109 10 46.84  | Oct. 9 8 21 5.4                    | 109 27 31.47   | -16 44.63         |
| 11 10 8 28.6                      | 96 16 50.53   | 11 10 6 17.6                       | 96 38 32.70  | -21 42.17         |
| 21 18 45 46.1                     | 66 51 9.12  | 21 18 43 45.2                      | 66 40 17.82  | +10 51.30         |
| Nov. 12 12 8 4.5                  | 67 35 2.37  | Nov. 12 12 5 42.9                  | 67 48 16.71  | -13 14.34         |
| Dec. 8 9 8 18.0                   | 74 38 37.02   | Dec. 8 9 6 10.9                    | 74 56 10.54  | -17 33.52         |
| 12 12 42 2.9                      | 61 45 44.51   | 12 12 39 35.7                      | 61 46 25.03  | - 40.52           |



*Interpolated North Polar Distances of the Moon.*

| Year and Day. | Edinburgh.<br>At Transit of<br>Moon's Centre. | Cape Mean Solar Time.  | Cape.<br>At Transit of<br>Moon's Centre. | Edinburgh - Cape. |
|---------------|---|--|--|-------------------|
| 1834.         |   |  |  |                   |
| Nov. 15       | 75° 14' 37.7"                                 | Nov. 15 <sup>d</sup> 11 <sup>h</sup> 24 <sup>m</sup> 32.5 <sup>s</sup> | 75° 30' 19.52"                           | -15' 41.82"       |
| Dec. 10       | 86° 40' 41.3"                                 | Dec. 10 7 58 44.9  | 86° 59' 9.46"                            | -18 28.16         |
| 1836.         |   |  |  |                   |
| Jan. 3        | 63° 33' 52.5"                                 | Jan. 3 12 1 33.8   | 63° 32' 38.11"                           | + 1 14.39         |
| Feb. 26       | 63° 22' 16.7"                                 | Feb. 26 7 48 55.1  | 63° 24' 27.76"                           | - 2 11.06         |
| March 26      | 63° 55' 19.2"                                 | Mar. 26 7 19 26.1  | 63° 49' 47.89"                           | + 5 31.31         |
| 30            | 79° 45' 47.6"                                 | 30 10 36 4.0   | 79° 24' 35.37"                           | +21 12.23         |
| April 24      | 67° 51' 40.4"                                 | April 24 6 51 3.6  | 67° 39' 4.81"                            | +12 35.59         |
| 25            | 71° 55' 43.9"                                 | 25 7 39 6.7  | 71° 39' 17.13"                           | +16 26.77         |
| 26            | 76° 58' 26.9"                                 | 26 8 25 58.1   | 76° 38' 46.83"                           | +19 40.07         |
| 28            | 89° 11' 8.4"                                  | 28 9 58 46.7   | 88° 47' 28.64"                           | +23 39.76         |
| 29            | 95° 49' 5.1"                                  | 29 10 46 47.7  | 95° 25' 6.36"                            | +23 58.74         |
| July 26       | 116° 48' 17.4"                                | July 26 10 48 2.6  | 116° 52' 23.91"                          | - 4 6.51          |
| Aug. 22       | 117° 16' 19.6"                                | Aug. 22 8 31 3.4   | 117° 17' 5.48"                           | - 0 45.88         |
| Sept. 20      | 114° 19' 39.5"                                | Sept. 20 8 25 58.4   | 114° 31' 46.32"                          | -12 6.82          |
| Oct. 19       | 106° 51' 36.7"                                | Oct. 19 8 11 54.9  | 107° 11' 7.38"                           | -19 30.68         |
| 21            | 94° 47' 28.0"                                 | 21 9 48 42.8   | 95° 10' 31.82"                           | -23 3.82          |
| 24            | 76° 23' 54.1"                                 | 24 12 3 23.8   | 76° 43' 38.82"                           | -19 44.72         |
| Dec. 15       | 92° 18' 59.8"                                 | Dec. 15 6 30 31.6  | 92° 41' 50.79"                           | -22 50.99         |
| 19            | 70° 3' 50.0"                                  | 19 9 27 43.0   | 70° 19' 10.05"                           | -15 20.05         |
| 23            | 62° 41' 15.8"                                 | 23 12 47 39.5  | 62° 38' 27.88"                           | + 2 47.92         |
| 1837.         |   |  |  |                   |
| Feb. 14       | 62° 55' 56.4"                                 | Feb. 14 7 47 20.3  | 63° 1' 4.56"                             | - 5 8.16          |
| 15            | 62° 14' 12.1"                                 | 15 8 38 33.3   | 62° 14' 22.26"                           | - 0 10.16         |
| 16            | 62° 54' 54.1"                                 | 16 9 29 34.2   | 62° 50' 9.93"                            | + 4 44.17         |
| 21            | 82° 43' 20.3"                                 | 21 13 18 15.6  | 82° 22' 38.20"                           | +20 42.10         |
| March 19      | 75° 13' 48.6"                                 | Mar. 19 10 32 45.1   | 74° 55' 28.02"                           | +18 20.58         |
| 20            | 80° 38' 21.3"                                 | 20 11 15 26.5  | 80° 17' 54.23"                           | +20 27.07         |

*Interpolated North Polar Distances of the Moon (concluded).*

| Year and Day.    | Edinburgh.<br>At Transit of<br>Moon's Centre. | Cape Mean Solar Time.   | Cape.<br>At Transit of<br>Moon's Centre. | Edinburgh—Cape. |
|------------------|---|---|--|-----------------|
| 1837.<br>June 14 | 102° 58' 46" 9                                | June 14 <sup>d</sup> 8 <sup>h</sup> 30 <sup>m</sup> 15 <sup>s</sup> 0 | 102° 37' 58" 69                          | + 20' 48" 21    |
| July 14          | 115 12 30 6                                   | July 14 8 55 23 6   | 115 0 39 65                              | + 11 50 95      |
| 15               | 117 33 20 7                                   | 15 9 57 33 8  | 117 28 8 76                              | + 5 11 94       |
| Oct. 11          | 96 12 58 2                                    | Oct. 11 10 6 17 6   | 96 38 32 70                              | — 25 34 50      |
| 21               | 66 53 6 1                                     | 21 18 43 45 2   | 66 40 17 82                              | + 12 48 28      |
| Nov. 12          | 67 32 42 4                                    | Nov. 12 12 5 42 9   | 67 48 16 71                              | — 15 34 31      |
| Dec. 9           | 69 22 28 3                                    | Dec. 9 9 56 17 7  | 69 39 29 46                              | — 17 1 16       |
| 11               | 62 44 37 9                                    | 11 11 43 51 7   | 62 51 18 66                              | — 6 40 76       |
| 12               | 61 45 38 9                                    | 12 12 39 35 7   | 61 46 25 03                              | — 0 46 13       |

SECTION VI.

*Comparison of Observed and Tabular Differences of North Polar Distance.*

*Cape and Greenwich.*

| Year and Day.    | Observed<br>Difference of<br>N.P.D. | Tabular<br>Difference of<br>N.P.D. | Tabular<br>—<br>Observed. | Year and Day.    | Observed<br>Difference of<br>N.P.D. | Tabular<br>Difference of<br>N.P.D. | Tabular<br>—<br>Observed. |
|------------------|-------------------------------------|------------------------------------|---------------------------|------------------|-------------------------------------|------------------------------------|---------------------------|
| 1830.<br>April 3 | + 9' 49" 11                         | + 9' 44" 45                        | — 4" 66                   | 1832.<br>June 10 | + 10' 41" 37                        | + 10' 44" 00                       | + 2" 63                   |
| 4                | + 11 00 03                          | + 10 54 33                         | — 5 70                    | July 8           | + 9 15 75                           | + 9 13 40                          | — 2 35                    |
| 5                | + 11 39 37                          | + 11 35 95                         | — 3 42                    | 20               | — 14 15 10                          | — 14 19 00                         | — 3 90                    |
| 6                | + 11 48 02                          | + 11 50 13                         | + 2 11                    | Aug. 10          | — 7 4 56                            | — 7 5 70                           | — 1 14                    |
| May 1            | + 10 43 43                          | + 10 40 47                         | — 2 96                    | 11               | — 9 35 95                           | — 9 32 50                          | + 3 45                    |
| 3                | + 11 56 53                          | + 11 51 69                         | — 4 84                    | Sept. 30         | + 2 54 57                           | + 2 51 90                          | — 2 67                    |
| 4                | + 11 51 50                          | + 11 48 67                         | — 2 83                    | Oct. 12          | — 10 50 03                          | — 10 51 90                         | — 1 87                    |
| Aug. 4           | — 9 49 71                           | — 9 53 71                          | — 4 00                    | Nov. 2           | — 11 29 10                          | — 11 30 70                         | — 1 60                    |
| 5                | — 12 16 27                          | — 12 18 81                         | — 2 54                    | 6                | — 15 7 59                           | — 15 7 00                          | + 0 59                    |
| 1832.<br>May 18  | — 1 29 02                           | — 1 29 40                          | — 0 38                    | 16               | + 15 26 62                          | + 15 23 20                         | — 3 42                    |
| 19               | — 4 21 85                           | — 4 26 90                          | — 5 05                    | Dec. 15          | + 15 40 28                          | + 15 36 60                         | — 3 68                    |

*Comparison of Observed and Tabular Differences of North Polar Distance (continued).**Cape and Greenwich.*

| Year and Day. | Observed Difference of N.P.D. | Tabular Difference of N.P.D. | Tabular — Observed. | Year and Day. | Observed Difference of N.P.D. | Tabular Difference of N.P.D. | Tabular — Observed. |
|---------------|-------------------------------|------------------------------|---------------------|---------------|-------------------------------|------------------------------|---------------------|
| 1833.         |                               |                              |                     | 1836.         |                               |                              |                     |
| Jan. 6        | + 4 42'49                     | + 4 43'80                    | + 1'31              | Feb. 29       | + 10 27'99                    | + 10 26'10                   | — 1'89              |
| 30            | — 10 50'73                    | — 10 51'20                   | — 0'47              | Mar. 6        | + 18 27'64                    | + 18 34'76                   | + 7'12              |
| Feb. 2        | + 1 44'37                     | + 1 46'40                    | + 2'03              | 8             | + 12 37'10                    | + 12 42'69                   | (+ 5'59)            |
| 3             | + 6 59'63                     | + 7 0'20                     | + 0'57              | 26            | + 4 48'94                     | + 4 41'60                    | (— 7'34)            |
| Mar. 4        | + 13 12'86                    | + 13 12'00                   | — 0'86              | 30            | + 18 11'91                    | + 18 4'75                    | (— 7'16)            |
| 5             | + 15 58'68                    | + 15 57'90                   | — 0'78              | 31            | + 19 53'93                    | + 19 43'46                   | (— 10'47)           |
| 6             | + 17 17'67                    | + 17 18'70                   | + 1'03              | April 25      | + 14 3'16                     | + 14 1'08                    | — 2'08              |
| April 3       | + 17 32'76                    | + 17 32'50                   | — 0'26              | 26            | + 16 46'90                    | + 16 46'03                   | — 0'87              |
| 5             | + 15 46'40                    | + 15 43'40                   | — 3'00              | 27            | + 18 55'06                    | + 18 52'57                   | — 2'49              |
| 28            | + 13 12'72                    | + 13 13'60                   | + 0'88              | 28            | + 20 11'51                    | + 20 11'06                   | — 0'45              |
| 29            | + 15 40'03                    | + 15 39'10                   | — 0'93              | 29            | + 20 24'23                    | + 20 27'53                   | + 3'30              |
| 30            | + 16 59'00                    | + 17 0'30                    | + 1'30              | June 29       | — 6 44'55                     | — 6 44'02                    | + 0'53              |
| 1834.         |                               |                              |                     | July 23       | + 13 58'27                    | + 13 57'61                   | — 0'66              |
| June 19       | + 10 33'45                    | + 10 33'00                   | — 0'45              | 26            | — 3 28'21                     | — 3 28'50                    | — 0'29              |
| 20            | + 6 2'91                      | + 6 2'18                     | — 0'73              | Oct. 19       | — 16 35'70                    | — 16 37'90                   | — 2'20              |
| 22            | — 3 28'33                     | — 3 25'71                    | + 2'62              | 20            | — 18 42'27                    | — 18 43'38                   | — 1'11              |
| 30            | — 15 8'75                     | — 15 10'79                   | — 2'04              | 21            | — 19 35'77                    | — 19 40'39                   | — 4'62              |
| July 14       | + 17 10'80                    | + 17 9'76                    | — 1'04              | 22            | — 19 33'04                    | — 19 36'88                   | — 3'84              |
| 15            | + 14 53'09                    | + 14 54'77                   | + 1'68              | 23            | — 18 34'28                    | — 18 38'87                   | — 4'59              |
| Aug. 22       | — 15 54'50                    | — 15 56'70                   | — 2'20              | Dec. 15       | — 19 23'67                    | — 19 29'80                   | — 6'13              |
| Sept. 11      | + 1 1'79                      | + 1 6'85                     | + 5'06              | 1837.         |                               |                              |                     |
| 12            | — 3 9'49                      | — 3 8'73                     | + 0'76              | Feb. 14       | — 4 23'73                     | — 4 24'05                    | — 0'32              |
| Oct. 13       | — 13 52'84                    | — 13 52'45                   | (+ 0'39)            | 21            | + 17 41'87                    | + 17 39'56                   | — 2'31              |
| 15            | — 15 46'25                    | — 15 40'60                   | (+ 5'65)            | Mar. 18       | + 13 15'74                    | + 13 13'30                   | — 2'44              |
| 16            | — 15 45'92                    | — 15 44'70                   | + 1'22              | 19            | + 15 38'42                    | + 15 38'59                   | + 0'17              |
| Dec. 10       | — 15 43'55                    | — 15 45'49                   | — 1'94              | 20            | + 17 27'02                    | + 17 26'62                   | — 0'40              |
| 11            | — 15 10'24                    | — 15 9'76                    | + 0'48              | April 20      | + 18 21'35                    | + 18 20'20                   | — 1'15              |
| 13            | — 12 18'22                    | — 12 14'75                   | + 3'47              | May 25        | — 16 59'61                    | — 16 55'28                   | + 4'33              |
| 1836.         |                               |                              |                     | June 14       | + 17 58'16                    | + 17 42'96                   | (— 15'20)           |
| Jan. 3        | + 1 2'57                      | + 1 2'37                     | — 0'20              | 24            | — 20 25'19                    | — 20 30'02                   | — 4'83              |
| 7             | + 15 13'38                    | + 15 14'57                   | + 1'19              |               |                               |                              |                     |

## Comparison of Observed and Tabular Differences of North Polar Distance (continued).

## Cape and Greenwich.

| Year and Day.    | Observed Difference of N.P.D. | Tabular Difference of N.P.D. | Tabular — Observed. | Year and Day.   | Observed Difference of N.P.D. | Tabular Difference of N.P.D. | Tabular — Observed. |
|------------------|-------------------------------|------------------------------|---------------------|-----------------|-------------------------------|------------------------------|---------------------|
| 1837.<br>July 11 | +17' 55" 31                   | +17' 55" 10                  | -0" 21              | 1837.<br>Oct. 9 | -16' 47" 49                   | -16' 49" 70                  | -2" 21              |
| 13               | +14' 9' 49                    | +14' 9' 46                   | -0" 03              | 11              | -21' 46' 96                   | -21' 48' 89                  | -1' 93              |
| 15               | +4' 28' 97                    | +4' 27' 78                   | -1' 19              | 21              | +10' 58' 52                   | +10' 54' 69                  | -3' 83              |
| 16               | -2' 22' 93                    | -2' 21' 34                   | +1' 59              | Nov. 12         | -13' 16' 75                   | -13' 18' 32                  | -1' 57              |
| Aug. 11          | +6' 59' 86                    | +6' 58' 38                   | -1' 48              | 16              | +5' 53' 59                    | +5' 52' 71                   | -0' 88              |
| 12               | +55' 78                       | +55' 45                      | -0' 33              | Dec. 8          | -17' 38' 38                   | -17' 38' 89                  | -0' 51              |
| Sept. 10         | -9' 9' 49                     | -9' 10' 77                   | -1' 28              |                 |                               |                              |                     |

## Cape and Cambridge.

| Year and Day.   | Observed Difference of N.P.D. | Tabular Difference of N.P.D. | Tabular — Observed. | Year and Day.    | Observed Difference of N.P.D. | Tabular Difference of N.P.D. | Tabular — Observed. |
|-----------------|-------------------------------|------------------------------|---------------------|------------------|-------------------------------|------------------------------|---------------------|
| 1833.<br>Jan. 6 | +4' 45" 99                    | +4' 42" 24                   | -3" 75              | 1833.<br>May 3   | +14' 37" 65                   | +14' 37" 37                  | -0" 28              |
| 28              | -13' 59' 20                   | -14' 2' 16                   | -2' 96              | 4                | +11' 59' 89                   | +12' 1' 65                   | +1' 76              |
| 30              | -10' 52' 10                   | -10' 47' 93                  | +4' 17              | 11               | -10' 25' 62                   | -10' 26' 43                  | -0' 81              |
| Feb. 28         | -5' 5' 75                     | -5' 3' 96                    | +1' 79              | 1834.<br>June 19 | +10' 28' 39                   | +10' 29' 86                  | +1' 47              |
| Mar. 4          | +13' 8' 56                    | +13' 7' 94                   | -0' 62              | 20               | +5' 58' 96                    | +6' 0' 44                    | +1' 48              |
| 5               | +15' 59' 49                   | +15' 53' 07                  | -6' 42              | 22               | -3' 29' 53                    | -3' 24' 66                   | +4' 87              |
| 28              | -2' 8' 63                     | -2' 7' 92                    | +0' 71              | July 15          | +14' 48' 85                   | +14' 50' 25                  | +1' 40              |
| 31              | +11' 12' 55                   | +11' 13' 73                  | +1' 18              | Oct. 13          | -13' 48' 64                   | -13' 48' 13                  | +0' 51              |
| April 1         | +14' 28' 54                   | +14' 29' 64                  | +1' 10              | 16               | -15' 38' 06                   | -15' 39' 68                  | -1' 62              |
| 3               | +17' 26' 43                   | +17' 27' 19                  | +0' 76              | Nov. 10          | -14' 50' 84                   | -14' 45' 24                  | (+5' 60)            |
| 5               | +15' 40' 77                   | +15' 38' 58                  | -2' 19              | 12               | -15' 43' 65                   | -15' 45' 64                  | -1' 99              |
| 26              | +5' 36' 22                    | +5' 36' 16                   | -0' 06              | Dec. 10          | -15' 39' 38                   | -15' 40' 54                  | -1' 16              |
| 28              | +13' 8' 13                    | +13' 9' 54                   | +1' 41              | 11               | -15' 5' 84                    | -15' 5' 01                   | +0' 83              |
| 29              | +15' 32' 14                   | +15' 34' 27                  | +2' 13              | 1836.<br>Mar. 13 | -12' 13' 80                   | -12' 10' 96                  | +2' 84              |
| 30              | +16' 54' 02                   | +16' 55' 09                  | +1' 07              | Mar. 30          | +18' 6' 19                    | +17' 59' 13                  | (-7' 06)            |

*Comparison of Observed and Tabular Differences of North Polar Distance (continued).**Cape and Cambridge.*

| Year and Day. | Observed Difference of N.P.D. | Tabular Difference of N.P.D. | Tabular - Observed. | Year and Day. | Observed Difference of N.P.D. | Tabular Difference of N.P.D. | Tabular - Observed. |
|---------------|-------------------------------|------------------------------|---------------------|---------------|-------------------------------|------------------------------|---------------------|
| 1836.         |                               |                              |                     | 1837.         |                               |                              |                     |
| Mar. 31       | +19' 47" 27                   | +19' 37" 34                  | (-9" 93)            | Mar. 19       | +15' 31" 43                   | +15' 33" 72                  | + 2" 29             |
| April 25      | +13' 58" 31                   | +13' 56" 77                  | -1" 54              | 20            | +17' 21" 15                   | +17' 21" 20                  | + 0" 05             |
| 27            | +18' 49" 44                   | +18' 46" 80                  | -2" 64              | April 14      | +12' 2" 77                    | +12' 0" 55                   | - 2" 22             |
| 29            | +20' 17" 85                   | +20' 21" 26                  | +3" 41              | 20            | +18' 13" 93                   | +18' 14" 57                  | + 0" 64             |
| May 2         | +12' 21" 96                   | +12' 25" 92                  | +3" 96              | June 14       | +17' 52" 29                   | +17' 37" 46                  | (-14" 83)           |
| June 24       | +18' 31" 16                   | +18' 32" 52                  | +1" 36              | 17            | + 7' 39" 85                   | + 7' 39" 34                  | - 0" 51             |
| 26            | +12' 4" 54                    | +12' 5" 66                   | +1" 12              | July 11       | +17' 50" 04                   | +17' 49" 63                  | - 0" 41             |
| 29            | - 6' 44" 32                   | - 6' 41" 87                  | +2" 45              | 14            | +10' 1" 23                    | +10' 4" 80                   | + 3" 57             |
| Sept. 23      | -19' 28" 69                   | -19' 30" 41                  | -1" 72              | 15            | + 4' 26" 35                   | + 4' 26" 45                  | + 0" 10             |
| Oct. 18       | -13' 10" 07                   | -13' 11" 97                  | -1" 90              | 16            | - 2' 25" 79                   | - 2' 20" 55                  | + 5" 24             |
| 19            | -16' 32" 18                   | -16' 32" 94                  | -0" 76              | Aug. 10       | +11' 34" 90                   | +11' 35" 13                  | + 0" 23             |
| 20            | -18' 34" 92                   | -18' 37" 67                  | -2" 75              | 11            | + 6' 56" 18                   | + 6' 56" 28                  | + 0" 10             |
| 21            | -19' 31" 85                   | -19' 34" 41                  | -2" 56              | 12            | + 55" 58                      | + 55" 23                     | - 0" 35             |
| 22            | -19' 28" 64                   | -19' 30" 88                  | -2" 24              | 13            | - 5' 51" 70                   | - 5' 49" 21                  | + 2" 49             |
| 23            | -18' 27" 84                   | -18' 33" 08                  | -5" 24              | Sept. 10      | - 9' 8" 89                    | - 9' 7" 92                   | + 0" 97             |
| Nov. 19       | -18' 34" 76                   | -18' 38" 04                  | -3" 28              | Oct. 9        | -16' 45" 47                   | -16' 44" 63                  | + 0" 84             |
| Dec. 23       | + 2' 25" 02                   | + 2' 21" 39                  | -3" 63              | 11            | -21' 42" 12                   | -21' 42" 17                  | - 0" 05             |
| 1837.         |                               |                              |                     | 21            | +10' 53" 38                   | +10' 51" 30                  | - 2" 08             |
| Feb. 14       | - 4' 22" 43                   | - 4' 22" 71                  | -0" 28              | Nov. 12       | -13' 13" 93                   | -13' 14" 34                  | - 0" 41             |
| 21            | +17' 33" 75                   | +17' 34" 16                  | +0" 41              | Dec. 8        | -17' 35" 22                   | -17' 33" 52                  | + 1" 70             |
| 22            | +18' 20" 72                   | +18' 22" 90                  | +2" 18              | 12            | - 36" 49                      | - 40" 52                     | - 4" 03             |
| Mar. 18       | +13' 9" 49                    | +13' 9" 16                   | -0" 33              |               |                               |                              |                     |

## Comparison of Observed and Tabular Differences of North Polar Distance (concluded).

## Cape and Edinburgh.

| Year and Day. | Observed Difference of N.P.D. | Tabular Difference of N.P.D. | Tabular - Observed. | Year and Day. | Observed Difference of N.P.D. | Tabular Difference of N.P.D. | Tabular - Observed. |
|---------------|-------------------------------|------------------------------|---------------------|---------------|-------------------------------|------------------------------|---------------------|
| 1834.         |                               |                              |                     | 1836.         |                               |                              |                     |
| Nov. 15       | -15' 39"83                    | -15' 41"82                   | -1"99               | Dec. 19       | -15' 19"01                    | -15' 20"05                   | -1"04               |
| Dec. 10       | -18 26'10                     | -18 28'16                    | -2'06               | 1837.         |                               |                              |                     |
| 1836.         |                               |                              |                     | 23            | + 2 49'85                     | + 2 47'92                    | -1'93               |
| Jan. 3        | + 1 13'61                     | + 1 14'39                    | +0'78               | Feb. 14       | - 5 9'70                      | - 5 8'16                     | +1'54               |
| Feb. 26       | - 2 11'91                     | - 2 11'06                    | +0'85               | 15            | - 10'60                       | - 10'16                      | +0'44               |
| Mar. 26       | + 5 38'77                     | + 5 31'31                    | (-7'46)             | 16            | + 4 41'64                     | + 4 44'17                    | +2'53               |
| 30            | +21 19'17                     | +21 12'23                    | (-6'94)             | 21            | +20 41'73                     | +20 42'10                    | +0'37               |
| April 24      | +12 34'74                     | +12 35'59                    | +0'85               | Mar. 19       | +18 17'94                     | +18 20'58                    | +2'64               |
| 25            | +16 28'53                     | +16 26'77                    | -1'76               | 20            | +20 27'89                     | +20 27'07                    | -0'82               |
| 26            | +19 40'14                     | +19 40'07                    | -0'07               | June 14       | +21 5'56                      | +20 48'21                    | (-17'35)            |
| 28            | +23 42'03                     | +23 39'76                    | -2'27               | July 14       | +11 48'91                     | +11 50'95                    | +2'04               |
| 29            | +23 58'25                     | +23 58'74                    | +0'49               | 15            | + 5 7'89                      | + 5 11'94                    | +4'05               |
| July 26       | - 4 7'11                      | - 4 6'51                     | +0'60               | Oct. 11       | -25 33'13                     | -25 34'50                    | -1'37               |
| Aug. 22       | - 50'43                       | - 45'88                      | +4'55               | 21            | +12 52'56                     | +12 48'28                    | -4'28               |
| Sept. 20      | -12 13'92                     | -12 6'82                     | (+7'10)             | Nov. 12       | -15 31'11                     | -15 34'31                    | -3'20               |
| Oct. 19       | -19 32'11                     | -19 30'68                    | +1'43               | Dec. 9        | -17 0'80                      | -17 1'16                     | -0'36               |
| 21            | -23 4'48                      | -23 3'82                     | +0'66               | 11            | - 6 40'52                     | - 6 40'76                    | -0'24               |
| 24            | -19 44'59                     | -19 44'72                    | -0'13               | 12            | - 42'47                       | - 46'13                      | -3'66               |
| Dec. 15       | -22 47'75                     | -22 50'99                    | -3'24               |               |                               |                              |                     |

SECTION VII.—*Equations of Condition.**Cape and Greenwich.*

| Date.                      |                   | Equations of Condition.                                       |
|----------------------------|-------------------|---|
| <sup>1830.</sup><br>Apr. 3 | — 4 <sup>66</sup> | + 1 <sup>31</sup> $\delta K$ + 0 <sup>13</sup> $\delta t$ = 0 |
| 4                          | — 5 <sup>70</sup> | + 1 <sup>31</sup> + 0 <sup>15</sup> = 0                       |
| 5                          | — 3 <sup>42</sup> | + 1 <sup>30</sup> + 0 <sup>16</sup> = 0                       |
| 6                          | + 2 <sup>11</sup> | + 1 <sup>28</sup> + 0 <sup>16</sup> = 0                       |
| May 1                      | — 2 <sup>96</sup> | + 1 <sup>32</sup> + 0 <sup>14</sup> = 0                       |
| 3                          | — 4 <sup>84</sup> | + 1 <sup>29</sup> + 0 <sup>16</sup> = 0                       |
| 4                          | — 2 <sup>83</sup> | + 1 <sup>27</sup> + 0 <sup>16</sup> = 0                       |
| Aug. 4                     | — 4 <sup>00</sup> | + 1 <sup>30</sup> — 0 <sup>13</sup> = 0                       |
| 5                          | — 2 <sup>54</sup> | + 1 <sup>34</sup> — 0 <sup>17</sup> = 0                       |
| <sup>1832.</sup><br>May 18 | — 0 <sup>38</sup> | + 1 <sup>12</sup> — 0 <sup>02</sup> = 0                       |
| 19                         | — 5 <sup>05</sup> | + 1 <sup>14</sup> — 0 <sup>06</sup> = 0                       |
| June 10                    | + 2 <sup>63</sup> | + 1 <sup>22</sup> + 0 <sup>15</sup> = 0                       |
| July 8                     | — 2 <sup>35</sup> | + 1 <sup>19</sup> + 0 <sup>12</sup> = 0                       |
| 20                         | — 3 <sup>90</sup> | + 1 <sup>37</sup> — 0 <sup>19</sup> = 0                       |
| Aug. 10                    | — 1 <sup>14</sup> | + 1 <sup>15</sup> — 0 <sup>10</sup> = 0                       |
| 11                         | + 3 <sup>45</sup> | + 1 <sup>18</sup> — 0 <sup>13</sup> = 0                       |
| Sept. 30                   | — 2 <sup>67</sup> | + 1 <sup>13</sup> + 0 <sup>04</sup> = 0                       |
| Oct. 12                    | — 1 <sup>87</sup> | + 1 <sup>38</sup> — 0 <sup>15</sup> = 0                       |
| Nov. 2                     | — 1 <sup>60</sup> | + 1 <sup>21</sup> — 0 <sup>16</sup> = 0                       |
| 6                          | + 0 <sup>59</sup> | + 1 <sup>37</sup> — 0 <sup>21</sup> = 0                       |
| 16                         | — 3 <sup>42</sup> | + 1 <sup>40</sup> + 0 <sup>18</sup> = 0                       |
| Dec. 15                    | — 3 <sup>68</sup> | + 1 <sup>35</sup> + 0 <sup>21</sup> = 0                       |
| <sup>1833.</sup><br>Jan. 6 | + 1 <sup>31</sup> | + 1 <sup>44</sup> + 0 <sup>06</sup> = 0                       |
| 30                         | — 0 <sup>47</sup> | + 1 <sup>38</sup> — 0 <sup>15</sup> = 0                       |
| Feb. 2                     | + 2 <sup>03</sup> | + 1 <sup>42</sup> + 0 <sup>02</sup> = 0                       |
| 3                          | + 0 <sup>57</sup> | + 1 <sup>44</sup> + 0 <sup>10</sup> = 0                       |
| Mar. 4                     | — 0 <sup>86</sup> | + 1 <sup>46</sup> $\delta K$ + 0 <sup>18</sup> $\delta t$ = 0 |

## Cape and Greenwich (continued).

| Date.                   |          | Equations of Condition.                 |
|-------------------------|----------|---|
| <sup>1833.</sup> Mar. 5 | — 0.78   | + 1.47 $\delta K$ + 0.22 $\delta t$ = 0 |
| 6                       | + 1.03   | + 1.45 + 0.23 = 0                       |
| Apr. 3                  | — 0.26   | + 1.44 + 0.24 = 0                       |
| 5                       | — 3.00   | + 1.34 + 0.21 = 0                       |
| 28                      | + 0.88   | + 1.42 + 0.18 = 0                       |
| 29                      | — 0.93   | + 1.43 + 0.21 = 0                       |
| <sup>1834.</sup> 30     | + 1.30   | + 1.43 + 0.23 = 0                       |
| June 19                 | — 0.45   | + 1.23 + 0.15 = 0                       |
| 20                      | — 0.73   | + 1.19 + 0.08 = 0                       |
| 22                      | + 2.62   | + 1.15 — 0.05 = 0                       |
| 30                      | — 2.04   | + 1.31 — 0.21 = 0                       |
| July 14                 | — 1.04   | + 1.35 + 0.23 = 0                       |
| 15                      | + 1.68   | + 1.29 + 0.20 = 0                       |
| Aug. 22                 | — 2.20   | + 1.28 — 0.22 = 0                       |
| Sept. 11                | + 5.06   | + 1.13 + 0.02 = 0                       |
| 12                      | + 0.76   | + 1.12 — 0.04 = 0                       |
| Oct. 13                 | (+ 0.39) | + 1.21 — 0.19 = 0                       |
| 15                      | (+ 5.65) | + 1.26 — 0.21 = 0                       |
| 16                      | + 1.22   | + 1.28 — 0.21 = 0                       |
| Dec. 10                 | — 1.94   | + 1.29 — 0.21 = 0                       |
| 11                      | + 0.48   | + 1.29 — 0.21 = 0                       |
| <sup>1836.</sup> 13     | + 3.47   | + 1.29 — 0.17 = 0                       |
| Jan. 3                  | — 0.20   | + 1.24 + 0.02 = 0                       |
| 7                       | + 1.19   | + 1.33 + 0.21 = 0                       |
| Feb. 29                 | — 1.89   | + 1.30 + 0.14 = 0                       |
| Mar. 6                  | + 7.12   | + 1.32 + 0.25 = 0                       |
| Apr. 25                 | — 2.08   | + 1.33 + 0.19 = 0                       |
| 26                      | — 0.87   | + 1.36 + 0.22 = 0                       |
| 27                      | — 2.49   | + 1.39 + 0.26 = 0                       |
| 28                      | — 0.45   | + 1.40 + 0.27 = 0                       |
| 29                      | + 3.30   | + 1.39 + 0.28 = 0                       |
| June 29                 | + 0.53   | + 1.20 — 0.09 = 0                       |
| July 23                 | — 0.66   | + 1.24 $\delta K$ + 0.19 $\delta t$ = 0 |



## Mr. BREEN, on the Constant of the

*Cape and Greenwich (concluded).*

| Date.            |        | Equations of Condition.                 |
|------------------|--------|---|
| 1836.<br>July 26 | — 0'29 | + 1'18 $\delta K$ — 0'05 $\delta t$ = 0 |
| Oct. 19          | — 2'20 | + 1'25 — 0'23 = 0                       |
| 20               | — 1'11 | + 1'30 — 0'25 = 0                       |
| 21               | — 4'62 | + 1'33 — 0'27 = 0                       |
| 22               | — 3'84 | + 1'36 — 0'27 = 0                       |
| 23               | — 4'59 | + 1'35 — 0'25 = 0                       |
| Dec. 15          | — 6'13 | + 1'34 — 0'26 = 0                       |
| 1837.<br>Feb. 14 | — 0'32 | + 1'24 — 0'06 = 0                       |
| 21               | — 2'31 | + 1'32 + 0'24 = 0                       |
| Mar. 18          | — 2'44 | + 1'28 + 0'18 = 0                       |
| 19               | + 0'17 | + 1'31 + 0'21 = 0                       |
| 20               | — 0'40 | + 1'32 + 0'24 = 0                       |
| Apr. 20          | — 1'15 | + 1'28 + 0'25 = 0                       |
| May 25           | + 4'33 | + 1'27 — 0'23 = 0                       |
| June 24          | — 4'83 | + 1'38 — 0'28 = 0                       |
| July 11          | — 0'21 | + 1'28 + 0'24 = 0                       |
| 13               | — 0'03 | + 1'21 + 0'19 = 0                       |
| 15               | — 1'19 | + 1'16 + 0'06 = 0                       |
| 16               | + 1'59 | + 1'16 — 0'03 = 0                       |
| Aug. 11          | — 1'48 | + 1'15 + 0'09 = 0                       |
| 12               | — 0'33 | + 1'14 + 0'01 = 0                       |
| Sept. 10         | — 1'28 | + 1'17 — 0'12 = 0                       |
| Oct. 9           | — 2'21 | + 1'26 — 0'23 = 0                       |
| 11               | — 1'93 | + 1'38 — 0'30 = 0                       |
| 21               | — 3'83 | + 1'26 + 0'15 = 0                       |
| Nov. 12          | — 1'57 | + 1'34 — 0'18 = 0                       |
| 16               | — 0'88 | + 1'25 + 0'08 = 0                       |
| Dec. 8           | — 0'51 | + 1'37 $\delta K$ — 0'24 $\delta t$ = 0 |

*Cape and Cambridge.*

| Year and Day. |          | Equations of Condition.                 |
|---------------|----------|---|
| 1833.         |          |   |
| Jan. 6        | — 3.75   | + 1.45 $\delta K$ + 0.06 $\delta t$ = 0 |
| 28            | — 2.96   | + 1.36 — 0.19 = 0                       |
| 30            | + 4.17   | + 1.39 — 0.15 = 0                       |
| Feb. 28       | + 1.79   | + 1.39 — 0.07 = 0                       |
| Mar. 4        | — 0.62   | + 1.47 + 0.18 = 0                       |
| 5             | — 6.42   | + 1.48 + 0.22 = 0                       |
| 28            | + 0.71   | + 1.38 — 0.03 = 0                       |
| 31            | + 1.18   | + 1.44 + 0.15 = 0                       |
| April 1       | + 1.10   | + 1.46 + 0.20 = 0                       |
| 3             | + 0.76   | + 1.44 + 0.24 = 0                       |
| 5             | — 2.19   | + 1.35 + 0.21 = 0                       |
| 26            | — 0.06   | + 1.39 + 0.08 = 0                       |
| 28            | + 1.41   | + 1.43 + 0.18 = 0                       |
| 29            | + 2.13   | + 1.44 + 0.21 = 0                       |
| 30            | + 1.07   | + 1.44 + 0.23 = 0                       |
| May 3         | — 0.28   | + 1.32 + 0.20 = 0                       |
| 4             | + 1.76   | + 1.26 + 0.16 = 0                       |
| 11            | — 0.81   | + 1.18 — 0.14 = 0                       |
| 1834.         |          |   |
| June 19       | + 1.47   | + 1.23 + 0.14 = 0                       |
| 20            | + 1.48   | + 1.19 + 0.08 = 0                       |
| 22            | + 4.87   | + 1.15 — 0.05 = 0                       |
| July 15       | + 1.40   | + 1.30 + 0.20 = 0                       |
| Oct. 13       | + 0.51   | + 1.21 — 0.19 = 0                       |
| 16            | — 1.62   | + 1.29 — 0.21 = 0                       |
| Nov. 10       | (+ 5.60) | + 1.23 — 0.20 = 0                       |
| 12            | — 1.99   | + 1.28 — 0.21 = 0                       |
| Dec. 10       | — 1.16   | + 1.29 — 0.21 = 0                       |
| 11            | + 0.83   | + 1.31 — 0.20 = 0                       |
| 13            | + 2.84   | + 1.31 $\delta K$ — 0.17 $\delta t$ = 0 |

## Mr. BREEN, on the Constant of the

*Cape and Cambridge (continued).*

| Year and Day.               |                        | Equations of Condition.   |
|-----------------------------|------------------------|---|
| <sup>1836.</sup><br>Mar. 30 | (- 7 <sup>''</sup> 06) | + 1 <sup>·</sup> 39 $\delta K$ + 0 <sup>·</sup> 24 $\delta t$ = 0 |
| 31                          | (- 9 <sup>·</sup> 93)  | + 1 <sup>·</sup> 41 + 0 <sup>·</sup> 27 = 0                       |
| April 25                    | - 1 <sup>·</sup> 54    | + 1 <sup>·</sup> 34 + 0 <sup>·</sup> 19 = 0                       |
| 27                          | - 2 <sup>·</sup> 64    | + 1 <sup>·</sup> 40 + 0 <sup>·</sup> 25 = 0                       |
| 29                          | + 3 <sup>·</sup> 41    | + 1 <sup>·</sup> 39 + 0 <sup>·</sup> 28 = 0                       |
| May 2                       | + 3 <sup>·</sup> 96    | + 1 <sup>·</sup> 23 + 0 <sup>·</sup> 17 = 0                       |
| June 24                     | + 1 <sup>·</sup> 36    | + 1 <sup>·</sup> 34 + 0 <sup>·</sup> 25 = 0                       |
| 26                          | + 1 <sup>·</sup> 12    | + 1 <sup>·</sup> 25 + 0 <sup>·</sup> 16 = 0                       |
| 29                          | + 2 <sup>·</sup> 45    | + 1 <sup>·</sup> 20 - 0 <sup>·</sup> 09 = 0                       |
| Sept. 23                    | - 1 <sup>·</sup> 72    | + 1 <sup>·</sup> 34 - 0 <sup>·</sup> 26 = 0                       |
| Oct. 18                     | - 1 <sup>·</sup> 90    | + 1 <sup>·</sup> 20 - 0 <sup>·</sup> 18 = 0                       |
| 19                          | - 0 <sup>·</sup> 76    | + 1 <sup>·</sup> 26 - 0 <sup>·</sup> 22 = 0                       |
| 20                          | - 2 <sup>·</sup> 75    | + 1 <sup>·</sup> 31 - 0 <sup>·</sup> 25 = 0                       |
| 21                          | - 2 <sup>·</sup> 56    | + 1 <sup>·</sup> 34 - 0 <sup>·</sup> 26 = 0                       |
| 22                          | - 2 <sup>·</sup> 24    | + 1 <sup>·</sup> 36 - 0 <sup>·</sup> 26 = 0                       |
| 23                          | - 5 <sup>·</sup> 24    | + 1 <sup>·</sup> 36 - 0 <sup>·</sup> 25 = 0                       |
| Nov. 19                     | - 3 <sup>·</sup> 28    | + 1 <sup>·</sup> 36 - 0 <sup>·</sup> 25 = 0                       |
| Dec. 23                     | - 3 <sup>·</sup> 63    | + 1 <sup>·</sup> 23 + 0 <sup>·</sup> 03 = 0                       |
| <sup>1837.</sup><br>Feb. 14 | - 0 <sup>·</sup> 28    | + 1 <sup>·</sup> 25 - 0 <sup>·</sup> 06 = 0                       |
| 21                          | + 0 <sup>·</sup> 41    | + 1 <sup>·</sup> 33 + 0 <sup>·</sup> 24 = 0                       |
| 22                          | + 2 <sup>·</sup> 18    | + 1 <sup>·</sup> 33 + 0 <sup>·</sup> 25 = 0                       |
| Mar. 18                     | - 0 <sup>·</sup> 33    | + 1 <sup>·</sup> 29 + 0 <sup>·</sup> 18 = 0                       |
| 19                          | + 2 <sup>·</sup> 29    | + 1 <sup>·</sup> 32 + 0 <sup>·</sup> 21 = 0                       |
| 20                          | + 0 <sup>·</sup> 05    | + 1 <sup>·</sup> 33 + 0 <sup>·</sup> 24 = 0                       |
| April 14                    | - 2 <sup>·</sup> 22    | + 1 <sup>·</sup> 28 + 0 <sup>·</sup> 16 = 0                       |
| 20                          | + 0 <sup>·</sup> 64    | + 1 <sup>·</sup> 29 + 0 <sup>·</sup> 25 = 0                       |
| June 14                     | (- 14 <sup>·</sup> 83) | + 1 <sup>·</sup> 29 + 0 <sup>·</sup> 24 = 0                       |
| 17                          | - 0 <sup>·</sup> 51    | + 1 <sup>·</sup> 17 + 0 <sup>·</sup> 10 = 0                       |
| July 11                     | - 0 <sup>·</sup> 41    | + 1 <sup>·</sup> 29 + 0 <sup>·</sup> 24 = 0                       |
| 14                          | + 3 <sup>·</sup> 57    | + 1 <sup>·</sup> 18 + 0 <sup>·</sup> 14 = 0                       |
| 15                          | + 0 <sup>·</sup> 10    | + 1 <sup>·</sup> 16 + 0 <sup>·</sup> 06 = 0                       |
| 16                          | + 5 <sup>·</sup> 24    | + 1 <sup>·</sup> 16 $\delta K$ - 0 <sup>·</sup> 03 $\delta t$ = 0 |

*Cape and Cambridge (concluded).*

| Year and Day.               |        | Equations of Condition.                 |
|-----------------------------|--------|---|
| <sup>1837.</sup><br>Aug. 10 | + 0.23 | + 1.17 $\delta K$ + 0.16 $\delta t$ = 0 |
| 11                          | + 0.10 | + 1.15 + 0.09 = 0                       |
| 12                          | - 0.35 | + 1.14 + 0.01 = 0                       |
| 13                          | + 2.49 | + 1.16 - 0.08 = 0                       |
| Sept. 10                    | + 0.97 | + 1.17 - 0.12 = 0                       |
| Oct. 9                      | + 0.84 | + 1.26 - 0.23 = 0                       |
| 11                          | - 0.05 | + 1.39 - 0.29 = 0                       |
| 21                          | - 2.08 | + 1.27 + 0.15 = 0                       |
| Nov. 12                     | - 0.41 | + 1.35 - 0.18 = 0                       |
| Dec. 8                      | + 1.70 | + 1.38 - 0.24 = 0                       |
| 12                          | - 4.03 | + 1.27 $\delta K$ - 0.01 $\delta t$ = 0 |

*Cape and Edinburgh.*

| Year and Day.               |          | Equations of Condition.                 |
|-----------------------------|----------|---|
| <sup>1834.</sup><br>Nov. 15 | - 1.99   | + 1.35 $\delta K$ - 0.18 $\delta t$ = 0 |
| Dec. 10                     | - 2.06   | + 1.33 - 0.21 = 0                       |
| <sup>1836.</sup><br>Jan. 3  | + 0.78   | + 1.31 + 0.01 = 0                       |
| Feb. 26                     | + 0.85   | + 1.30 - 0.03 = 0                       |
| Mar. 26                     | (- 7.46) | + 1.32 + 0.06 = 0                       |
| 30                          | (- 6.94) | + 1.44 + 0.25 = 0                       |
| Apr. 24                     | + 0.85   | + 1.35 + 0.15 = 0                       |
| 25                          | - 1.76   | + 1.39 + 0.19 = 0                       |
| 26                          | - 0.07   | + 1.42 + 0.23 = 0                       |
| 28                          | - 2.27   | + 1.45 + 0.27 = 0                       |
| 29                          | + 0.49   | + 1.43 + 0.28 = 0                       |
| July 26                     | + 0.60   | + 1.19 - 0.05 = 0                       |
| Aug. 22                     | + 4.55   | + 1.16 - 0.01 = 0                       |
| Sept. 20                    | (+ 7.10) | + 1.19 $\delta K$ - 0.14 $\delta t$ = 0 |

## Mr. BREEN, on the Constant of the

*Cape and Edinburgh (concluded).*

| Year and Day. |           | Equations of Condition.                 |
|---------------|-----------|---|
| 1836.         |           |   |
| Oct. 19       | + 1'43    | + 1'28 $\delta K$ - 0'23 $\delta t$ = 0 |
| 21            | + 0'66    | + 1'28 - 0'27 = 0                       |
| 24            | - 0'13    | + 1'40 - 0'23 = 0                       |
| Dec. 15       | - 3'24    | + 1'39 - 0'26 = 0                       |
| 19            | - 1'04    | + 1'35 - 0'18 = 0                       |
| 23            | - 1'93    | + 1'29 + 0'03 = 0                       |
| 1837.         |           |   |
| Feb. 14       | + 1'54    | + 1'31 - 0'06 = 0                       |
| 15            | + 0'44    | + 1'25 - 0'00 = 0                       |
| 16            | + 2'53    | + 1'29 + 0'05 = 0                       |
| 21            | + 0'37    | + 1'37 + 0'24 = 0                       |
| Mar. 19       | + 2'64    | + 1'37 + 0'21 = 0                       |
| 20            | - 0'82    | + 1'38 + 0'24 = 0                       |
| June 14       | (- 17'35) | + 1'31 + 0'24 = 0                       |
| July 14       | + 2'04    | + 1'19 + 0'14 = 0                       |
| 15            | + 4'05    | + 1'17 + 0'06 = 0                       |
| Oct. 11       | - 1'37    | + 1'43 - 0'30 = 0                       |
| 21            | - 4'28    | + 1'33 + 0'15 = 0                       |
| Nov. 12       | - 3'20    | + 1'41 - 0'18 = 0                       |
| Dec. 9        | - 0'36    | + 1'41 - 0'20 = 0                       |
| 11            | - 0'24    | + 1'35 - 0'08 = 0                       |
| 12            | - 3'66    | + 1'33 $\delta K$ - 0'01 $\delta t$ = 0 |

*Cape, and the Mean of Greenwich, Cambridge, and Edinburgh.*

| Year and Day. | Greenwich.          | Cambridge.          | Mean.               | Equation.   | Weight.           |
|---------------|---------------------|---------------------|---------------------|---|-------------------|
| 1830.         |                     |                     |                     |   |                   |
| Apr. 3        | — 4 <sup>h</sup> 66 | "                   | "                   | + 1 <sup>h</sup> 31 $\delta K$ + 0 <sup>h</sup> 13 $\delta t$ = 0 | 1 <sup>h</sup> 00 |
| 4             | — 5 <sup>h</sup> 70 |                     |                     | + 1 <sup>h</sup> 31 + 0 <sup>h</sup> 15 = 0                       | 1 <sup>h</sup> 00 |
| 5             | — 3 <sup>h</sup> 42 |                     |                     | + 1 <sup>h</sup> 30 + 0 <sup>h</sup> 16 = 0                       | 1 <sup>h</sup> 00 |
| 6             | + 2 <sup>h</sup> 11 |                     |                     | + 1 <sup>h</sup> 28 + 0 <sup>h</sup> 16 = 0                       | 1 <sup>h</sup> 00 |
| May 1         | — 2 <sup>h</sup> 96 |                     |                     | + 1 <sup>h</sup> 32 + 0 <sup>h</sup> 14 = 0                       | 1 <sup>h</sup> 00 |
| 3             | — 4 <sup>h</sup> 84 |                     |                     | + 1 <sup>h</sup> 29 + 0 <sup>h</sup> 16 = 0                       | 1 <sup>h</sup> 00 |
| 4             | — 2 <sup>h</sup> 83 |                     |                     | + 1 <sup>h</sup> 27 + 0 <sup>h</sup> 16 = 0                       | 1 <sup>h</sup> 00 |
| Aug. 4        | — 4 <sup>h</sup> 00 |                     |                     | + 1 <sup>h</sup> 30 — 0 <sup>h</sup> 13 = 0                       | 1 <sup>h</sup> 00 |
| 5             | — 2 <sup>h</sup> 54 |                     |                     | + 1 <sup>h</sup> 34 — 0 <sup>h</sup> 17 = 0                       | 1 <sup>h</sup> 00 |
| 1832.         |                     |                     |                     |   |                   |
| May 18        | — 0 <sup>h</sup> 38 |                     |                     | + 1 <sup>h</sup> 12 — 0 <sup>h</sup> 02 = 0                       | 1 <sup>h</sup> 00 |
| 19            | — 5 <sup>h</sup> 05 |                     |                     | + 1 <sup>h</sup> 14 — 0 <sup>h</sup> 06 = 0                       | 1 <sup>h</sup> 00 |
| June 10       | + 2 <sup>h</sup> 63 |                     |                     | + 1 <sup>h</sup> 22 + 0 <sup>h</sup> 15 = 0                       | 1 <sup>h</sup> 00 |
| July 8        | — 2 <sup>h</sup> 35 |                     |                     | + 1 <sup>h</sup> 19 + 0 <sup>h</sup> 12 = 0                       | 1 <sup>h</sup> 00 |
| 20            | — 3 <sup>h</sup> 90 |                     |                     | + 1 <sup>h</sup> 37 — 0 <sup>h</sup> 19 = 0                       | 1 <sup>h</sup> 00 |
| Aug. 10       | — 1 <sup>h</sup> 14 |                     |                     | + 1 <sup>h</sup> 15 — 0 <sup>h</sup> 10 = 0                       | 1 <sup>h</sup> 00 |
| 11            | + 3 <sup>h</sup> 45 |                     |                     | + 1 <sup>h</sup> 18 — 0 <sup>h</sup> 13 = 0                       | 1 <sup>h</sup> 00 |
| Sept. 30      | — 2 <sup>h</sup> 67 |                     |                     | + 1 <sup>h</sup> 13 + 0 <sup>h</sup> 04 = 0                       | 1 <sup>h</sup> 00 |
| Oct. 12       | — 1 <sup>h</sup> 87 |                     |                     | + 1 <sup>h</sup> 38 — 0 <sup>h</sup> 15 = 0                       | 1 <sup>h</sup> 00 |
| Nov. 2        | — 1 <sup>h</sup> 60 |                     |                     | + 1 <sup>h</sup> 21 — 0 <sup>h</sup> 16 = 0                       | 1 <sup>h</sup> 00 |
| 6             | + 0 <sup>h</sup> 59 |                     |                     | + 1 <sup>h</sup> 37 — 0 <sup>h</sup> 21 = 0                       | 1 <sup>h</sup> 00 |
| 16            | — 3 <sup>h</sup> 42 |                     |                     | + 1 <sup>h</sup> 40 + 0 <sup>h</sup> 18 = 0                       | 1 <sup>h</sup> 00 |
| Dec. 15       | — 3 <sup>h</sup> 68 |                     |                     | + 1 <sup>h</sup> 35 + 0 <sup>h</sup> 21 = 0                       | 1 <sup>h</sup> 00 |
| 1833.         |                     |                     |                     |   |                   |
| Jan. 6        | + 1 <sup>h</sup> 31 | — 3 <sup>h</sup> 75 | — 1 <sup>h</sup> 22 | + 1 <sup>h</sup> 45 + 0 <sup>h</sup> 06 = 0                       | 1 <sup>h</sup> 15 |
| 28            |                     | — 2 <sup>h</sup> 96 | — 2 <sup>h</sup> 96 | + 1 <sup>h</sup> 36 — 0 <sup>h</sup> 19 = 0                       | 1 <sup>h</sup> 00 |
| 30            | — 0 <sup>h</sup> 47 | + 4 <sup>h</sup> 17 | + 1 <sup>h</sup> 85 | + 1 <sup>h</sup> 39 — 0 <sup>h</sup> 15 = 0                       | 1 <sup>h</sup> 15 |
| Feb. 2        | + 2 <sup>h</sup> 03 |                     | + 2 <sup>h</sup> 03 | + 1 <sup>h</sup> 42 $\delta K$ + 0 <sup>h</sup> 02 $\delta t$ = 0 | 1 <sup>h</sup> 00 |

Cape, and the Mean of Greenwich, Cambridge, and Edinburgh (continued).

| Year and Day. | Greenwich.           | Cambridge.           | Edinburgh.        | Mean.                | Equation.   | Weight.         |
|---------------|----------------------|----------------------|-------------------|----------------------|---|-----------------|
| 1833.         |                      |                      |                   |                      |   |                 |
| Feb. 3        | + 0 <sup>57</sup>    | ..                   | ..                | + 0 <sup>57</sup>    | + 1 <sup>44</sup> $\delta K$ + 0 <sup>10</sup> $\delta t$ = 0 | 1 <sup>00</sup> |
| 28            | ..                   | + 1 <sup>79</sup>    | ..                | + 1 <sup>79</sup>    | + 1 <sup>39</sup> - 0 <sup>07</sup> = 0                       | 1 <sup>00</sup> |
| March 4       | - 0 <sup>86</sup>    | - 0 <sup>62</sup>    | ..                | - 0 <sup>74</sup>    | + 1 <sup>47</sup> + 0 <sup>18</sup> = 0                       | 1 <sup>15</sup> |
| 5             | - 0 <sup>78</sup>    | - 6 <sup>42</sup>    | ..                | - 3 <sup>60</sup>    | + 1 <sup>47</sup> + 0 <sup>22</sup> = 0                       | 1 <sup>15</sup> |
| 6             | + 1 <sup>03</sup>    | ..                   | ..                | + 1 <sup>03</sup>    | + 1 <sup>45</sup> + 0 <sup>23</sup> = 0                       | 1 <sup>00</sup> |
| 28            | ..                   | + 0 <sup>71</sup>    | ..                | + 0 <sup>71</sup>    | + 1 <sup>38</sup> - 0 <sup>03</sup> = 0                       | 1 <sup>00</sup> |
| 31            | ..                   | + 1 <sup>18</sup>    | ..                | + 1 <sup>18</sup>    | + 1 <sup>44</sup> + 0 <sup>15</sup> = 0                       | 1 <sup>00</sup> |
| April 1       | ..                   | + 1 <sup>10</sup>    | ..                | + 1 <sup>10</sup>    | + 1 <sup>46</sup> + 0 <sup>20</sup> = 0                       | 1 <sup>00</sup> |
| 3             | - 0 <sup>26</sup>    | + 0 <sup>76</sup>    | ..                | + 0 <sup>25</sup>    | + 1 <sup>44</sup> + 0 <sup>24</sup> = 0                       | 1 <sup>15</sup> |
| 5             | - 3 <sup>00</sup>    | - 2 <sup>19</sup>    | ..                | - 2 <sup>60</sup>    | + 1 <sup>35</sup> + 0 <sup>21</sup> = 0                       | 1 <sup>15</sup> |
| 26            | ..                   | - 0 <sup>06</sup>    | ..                | - 0 <sup>06</sup>    | + 1 <sup>39</sup> + 0 <sup>08</sup> = 0                       | 1 <sup>00</sup> |
| 28            | + 0 <sup>88</sup>    | + 1 <sup>41</sup>    | ..                | + 1 <sup>15</sup>    | + 1 <sup>42</sup> + 0 <sup>18</sup> = 0                       | 1 <sup>15</sup> |
| 29            | - 0 <sup>93</sup>    | + 2 <sup>13</sup>    | ..                | + 0 <sup>60</sup>    | + 1 <sup>44</sup> + 0 <sup>21</sup> = 0                       | 1 <sup>15</sup> |
| 30            | + 1 <sup>30</sup>    | + 1 <sup>07</sup>    | ..                | + 1 <sup>19</sup>    | + 1 <sup>44</sup> + 0 <sup>23</sup> = 0                       | 1 <sup>15</sup> |
| May 3         | ..                   | - 0 <sup>28</sup>    | ..                | - 0 <sup>28</sup>    | + 1 <sup>32</sup> + 0 <sup>20</sup> = 0                       | 1 <sup>00</sup> |
| 4             | ..                   | + 1 <sup>76</sup>    | ..                | + 1 <sup>76</sup>    | + 1 <sup>26</sup> + 0 <sup>16</sup> = 0                       | 1 <sup>00</sup> |
| 11            | ..                   | - 0 <sup>81</sup>    | ..                | - 0 <sup>81</sup>    | + 1 <sup>18</sup> - 0 <sup>14</sup> = 0                       | 1 <sup>00</sup> |
| 1834.         |                      |                      |                   |                      |   |                 |
| June 19       | - 0 <sup>45</sup>    | + 1 <sup>47</sup>    | ..                | + 0 <sup>51</sup>    | + 1 <sup>23</sup> + 0 <sup>14</sup> = 0                       | 1 <sup>15</sup> |
| 20            | - 0 <sup>73</sup>    | + 1 <sup>48</sup>    | ..                | + 0 <sup>38</sup>    | + 1 <sup>19</sup> + 0 <sup>08</sup> = 0                       | 1 <sup>15</sup> |
| 22            | + 2 <sup>62</sup>    | + 4 <sup>87</sup>    | ..                | + 3 <sup>75</sup>    | + 1 <sup>15</sup> - 0 <sup>05</sup> = 0                       | 1 <sup>15</sup> |
| 30            | - 2 <sup>04</sup>    | ..                   | ..                | - 2 <sup>04</sup>    | + 1 <sup>31</sup> - 0 <sup>21</sup> = 0                       | 1 <sup>00</sup> |
| July 14       | - 1 <sup>04</sup>    | ..                   | ..                | - 1 <sup>04</sup>    | + 1 <sup>35</sup> + 0 <sup>23</sup> = 0                       | 1 <sup>00</sup> |
| 15            | + 1 <sup>68</sup>    | + 1 <sup>40</sup>    | ..                | + 1 <sup>54</sup>    | + 1 <sup>30</sup> + 0 <sup>20</sup> = 0                       | 1 <sup>15</sup> |
| Aug. 22       | - 2 <sup>20</sup>    | ..                   | ..                | - 2 <sup>20</sup>    | + 1 <sup>28</sup> - 0 <sup>22</sup> = 0                       | 1 <sup>00</sup> |
| Sept. 11      | + 5 <sup>06</sup>    | ..                   | ..                | + 5 <sup>06</sup>    | + 1 <sup>13</sup> + 0 <sup>02</sup> = 0                       | 1 <sup>00</sup> |
| 12            | + 0 <sup>76</sup>    | ..                   | ..                | - 0 <sup>76</sup>    | + 1 <sup>12</sup> - 0 <sup>04</sup> = 0                       | 1 <sup>00</sup> |
| Oct. 13       | (+ 0 <sup>39</sup> ) | (+ 0 <sup>51</sup> ) | ..                | (+ 0 <sup>45</sup> ) | + 1 <sup>21</sup> - 0 <sup>19</sup> = 0                       | 1 <sup>15</sup> |
| 15            | (+ 5 <sup>65</sup> ) | ..                   | ..                | (+ 5 <sup>65</sup> ) | + 1 <sup>26</sup> - 0 <sup>21</sup> = 0                       | 1 <sup>00</sup> |
| 16            | + 1 <sup>22</sup>    | - 1 <sup>62</sup>    | ..                | - 0 <sup>20</sup>    | + 1 <sup>28</sup> - 0 <sup>21</sup> = 0                       | 1 <sup>15</sup> |
| Nov. 10       | ..                   | (+ 5 <sup>60</sup> ) | ..                | (+ 5 <sup>60</sup> ) | + 1 <sup>23</sup> - 0 <sup>20</sup> = 0                       | 1 <sup>00</sup> |
| 12            | ..                   | - 1 <sup>99</sup>    | ..                | - 1 <sup>99</sup>    | + 1 <sup>28</sup> - 0 <sup>21</sup> = 0                       | 1 <sup>00</sup> |
| 15            | ..                   | ..                   | - 1 <sup>99</sup> | - 1 <sup>99</sup>    | + 1 <sup>35</sup> $\delta K$ - 0 <sup>18</sup> $\delta t$ = 0 | 1 <sup>00</sup> |

Cape, and the Mean of Greenwich, Cambridge, and Edinburgh (continued).

| Year and Day.    | Greenwich. | Cambridge. | Edinburgh. | Mean.  | Equation.                               | Weight. |
|------------------|------------|------------|------------|--------|---|---------|
| 1834.<br>Dec. 10 | — 1'94     | — 1'16     | — 2'06     | — 1'72 | + 1'30 $\delta K$ — 0'21 $\delta t$ = 0 | 1'50    |
| 11               | + 0'48     | + 0'83     | ..         | + 0'66 | + 1'30 — 0'20 = 0                       | 1'15    |
| 1836.<br>Jan. 13 | + 3'47     | + 2'84     | ..         | + 3'16 | + 1'30 — 0'17 = 0                       | 1'15    |
| 3                | — 0'20     | ..         | + 0'78     | + 0'29 | + 1'28 + 0'02 = 0                       | 1'15    |
| 7                | + 1'19     | ..         | ..         | + 1'19 | + 1'33 + 0'21 = 0                       | 1'00    |
| Feb. 26          | ..         | ..         | + 0'85     | + 0'85 | + 1'30 — 0'03 = 0                       | 1'00    |
| 29               | — 1'89     | ..         | ..         | — 1'89 | + 1'30 + 0'14 = 0                       | 1'00    |
| March 6          | + 7'12     | ..         | ..         | + 7'12 | + 1'32 + 0'25 = 0                       | 1'00    |
| April 24         | ..         | ..         | + 0'85     | + 0'85 | + 1'35 + 0'15 = 0                       | 1'00    |
| 25               | — 2'08     | — 1'54     | — 1'76     | — 1'79 | + 1'36 + 0'19 = 0                       | 1'50    |
| 26               | — 0'87     | ..         | — 0'07     | — 0'47 | + 1'39 + 0'23 = 0                       | 1'15    |
| 27               | — 2'49     | — 2'64     | ..         | — 2'57 | + 1'40 + 0'25 = 0                       | 1'15    |
| 28               | — 0'45     | ..         | — 2'27     | — 1'36 | + 1'43 + 0'27 = 0                       | 1'15    |
| 29               | + 3'30     | + 3'41     | + 0'49     | + 2'40 | + 1'40 + 0'28 = 0                       | 1'50    |
| May 2            | ..         | + 3'96     | ..         | + 3'96 | + 1'23 + 0'17 = 0                       | 1'00    |
| June 24          | ..         | + 1'36     | ..         | + 1'36 | + 1'34 + 0'25 = 0                       | 1'00    |
| 26               | ..         | + 1'12     | ..         | + 1'12 | + 1'25 + 0'16 = 0                       | 1'00    |
| 29               | + 0'53     | + 2'45     | ..         | + 1'49 | + 1'20 — 0'09 = 0                       | 1'15    |
| July 23          | — 0'66     | ..         | ..         | — 0'66 | + 1'24 + 0'19 = 0                       | 1'00    |
| 26               | — 0'29     | ..         | + 0'60     | + 0'15 | + 1'18 — 0'05 = 0                       | 1'15    |
| Aug. 22          | ..         | ..         | + 4'55     | + 4'55 | + 1'16 — 0'01 = 0                       | 1'00    |
| Sept. 23         | ..         | — 1'72     | ..         | — 1'72 | + 1'34 — 0'26 = 0                       | 1'00    |
| Oct. 18          | ..         | — 1'90     | ..         | — 1'90 | + 1'20 — 0'18 = 0                       | 1'00    |
| 19               | — 2'20     | — 0'76     | + 1'43     | — 0'51 | + 1'26 — 0'23 = 0                       | 1'50    |
| 20               | — 1'11     | — 2'75     | ..         | — 1'93 | + 1'30 — 0'25 = 0                       | 1'15    |
| 21               | — 4'62     | — 2'56     | + 0'66     | — 2'17 | + 1'32 — 0'27 = 0                       | 1'50    |
| 22               | — 3'84     | — 2'24     | ..         | — 3'04 | + 1'36 — 0'26 = 0                       | 1'15    |
| 23               | — 4'59     | — 5'24     | ..         | — 4'92 | + 1'35 — 0'25 = 0                       | 1'15    |
| 24               | ..         | ..         | — 0'13     | — 0'13 | + 1'40 — 0'23 = 0                       | 1'00    |
| Nov. 19          | ..         | — 3'28     | ..         | — 3'28 | + 1'36 — 0'25 = 0                       | 1'00    |
| Dec. 15          | — 6'13     | ..         | — 3'24     | — 4'69 | + 1'37 — 0'26 = 0                       | 1'15    |
| 19               | ..         | ..         | — 1'04     | — 1'04 | + 1'35 $\delta K$ — 0'18 $\delta t$ = 0 | 1'00    |



*Cape, and the Mean of Greenwich, Cambridge, and Edinburgh (concluded).*

| Year and Day.    | Greenwich. | Cambridge. | Edinburgh. | Mean.  | Equation.                               | Weight. |
|------------------|------------|------------|------------|--------|---|---------|
| 1836.<br>Dec. 23 | ..         | - 3'63     | - 1'93     | - 2'78 | + 1'26 $\delta K$ + 0'03 $\delta t$ = 0 | 1'15    |
| 1837.<br>Feb. 14 | - 0'32     | - 0'28     | + 1'54     | + 0'31 | + 1'27 - 0'06 = 0                       | 1'50    |
| 15               | ..         | ..         | + 0'44     | + 0'44 | + 1'25 0'00 = 0                         | 1'00    |
| 16               | ..         | ..         | + 2'53     | + 2'53 | + 1'29 + 0'05 = 0                       | 1'00    |
| 21               | - 2'31     | + 0'41     | + 0'37     | - 0'51 | + 1'34 + 0'24 = 0                       | 1'50    |
| 22               | ..         | + 2'18     | ..         | + 2'18 | + 1'33 + 0'25 = 0                       | 1'00    |
| Mar. 18          | - 2'44     | - 0'33     | ..         | - 1'39 | + 1'29 + 0'18 = 0                       | 1'15    |
| 19               | + 0'17     | + 2'29     | + 2'64     | + 1'70 | + 1'34 + 0'21 = 0                       | 1'50    |
| 20               | - 0'40     | + 0'05     | - 0'82     | - 0'39 | + 1'34 + 0'24 = 0                       | 1'50    |
| April 14         | ..         | - 2'22     | ..         | - 2'22 | + 1'28 + 0'16 = 0                       | 1'00    |
| 20               | - 1'15     | + 0'64     | ..         | - 0'26 | + 1'28 + 0'25 = 0                       | 1'15    |
| May 25           | + 4'33     | ..         | ..         | + 4'33 | + 1'27 - 0'23 = 0                       | 1'00    |
| June 17          | ..         | - 0'51     | ..         | - 0'51 | + 1'17 + 0'10 = 0                       | 1'00    |
| 24               | - 4'83     | ..         | ..         | - 4'83 | + 1'38 - 0'28 = 0                       | 1'00    |
| July 11          | - 0'21     | - 0'41     | ..         | - 0'31 | + 1'28 + 0'24 = 0                       | 1'15    |
| 13               | - 0'03     | ..         | ..         | - 0'03 | + 1'21 + 0'19 = 0                       | 1'00    |
| 14               | ..         | + 3'57     | + 2'04     | + 2'81 | + 1'18 + 0'14 = 0                       | 1'15    |
| 15               | - 1'19     | + 0'10     | + 4'05     | + 0'99 | + 1'16 + 0'06 = 0                       | 1'50    |
| 16               | + 1'59     | + 5'24     | ..         | + 3'42 | + 1'16 - 0'03 = 0                       | 1'15    |
| Aug. 10          | ..         | + 0'23     | ..         | + 0'23 | + 1'17 + 0'16 = 0                       | 1'00    |
| 11               | - 1'48     | + 0'10     | ..         | - 0'69 | + 1'15 + 0'09 = 0                       | 1'15    |
| 12               | - 0'33     | - 0'35     | ..         | - 0'34 | + 1'14 + 0'01 = 0                       | 1'15    |
| 13               | ..         | + 2'49     | ..         | + 2'49 | + 1'16 - 0'08 = 0                       | 1'00    |
| Sept. 10         | - 1'28     | + 0'97     | ..         | - 0'16 | + 1'17 - 0'12 = 0                       | 1'15    |
| Oct. 9           | - 2'21     | + 0'84     | ..         | - 0'69 | + 1'26 - 0'22 = 0                       | 1'15    |
| 11               | - 1'93     | - 0'05     | - 1'37     | - 1'12 | + 1'40 - 0'30 = 0                       | 1'50    |
| 21               | - 3'83     | - 2'08     | - 4'28     | - 3'40 | + 1'29 + 0'15 = 0                       | 1'50    |
| Nov. 12          | - 1'57     | - 0'41     | - 3'20     | - 1'73 | + 1'37 - 0'18 = 0                       | 1'50    |
| 16               | - 0'88     | ..         | ..         | - 0'88 | + 1'25 + 0'08 = 0                       | 1'00    |
| Dec. 8           | - 0'51     | + 1'70     | ..         | + 0'60 | + 1'37 - 0'24 = 0                       | 1'15    |
| 9                | ..         | ..         | - 0'36     | - 0'36 | + 1'41 - 0'20 = 0                       | 1'00    |
| 11               | ..         | ..         | - 0'24     | - 0'24 | + 1'35 - 0'08 = 0                       | 1'00    |
| 12               | ..         | - 4'03     | - 3'66     | - 3'65 | + 1'30 $\delta K$ - 0'01 $\delta t$ = 0 | 1'15    |



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